

To: James Cashwell From: Chris Ricardi Date: June 21, 2012

Subject: Interim Response Steps Work Plan Slurry Wall Monitoring Program 1Q12 –

February/March 2012

DATA VALIDATION REPORT
FEBRUARY/MARCH 2012 SLURRY WALL GROUNDWATER AND SURFACE WATER
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

TestAmerica Laboratories Data Sets: 360-39255-1, 360-39262-1, 360-39434-1, and 360-39540-1

1.0 INTRODUCTION

Groundwater and surface water samples were collected from the Olin Chemical Superfund Site from February 22 to March 12, 2012. Samples were analyzed by TestAmerica Laboratories in Westfield, Massachusetts. Data were reported in sample delivery groups (SDGs) 360-39255-1, 360-39262-1, 360-39434-1 and 360-39540-1. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for the following USEPA SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- dissolved metals (aluminum and chromium) by USEPA Method 6010C in groundwater
- dissolved and total metals (aluminum, chromium, and sodium) by USEPA Method 6010C in surface water
- general chemistry analyses for ammonia by USEPA Method 350.1 (Lachat 10-107-06-1B), chloride, nitrate, nitrite, and sulfate by USEPA Method 300, and specific conductance by SM 2510B

The Final Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2010] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington monitoring tasks. Final sample results are presented on data summaries in Table 2. A summary of validation qualification actions is presented on Table 3 for results that were qualified. Validation reason codes are associated with final results that have been qualified as indicated in Table 3.



With the exception of the data qualification items discussed in the sections below, results are determined to be usable as reported by the laboratory.

2.0 METALS

Data were reviewed for the following parameters:

- * Data Completeness
- * Holding Time
- * Blanks
- * Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
- Matrix Spike Analysis (groundwater only)
- * Field Duplicate Results (groundwater only)
- Detection Limits
 Dissolved vs. Total Metals Comparison (surface water only)
- * = indicates that criteria were met for this parameter

<u>Dissolved vs. Total Metals Comparison</u>

SDG 360-39255-1

Concentrations of sodium, aluminum, and chromium in the dissolved fraction were over ten percent greater than concentrations reported in the total fraction in a subset of surface water samples in SDG 360-39255-1 as presented in the table below. The results in these samples were qualified estimated (J).

				Analyte	% Dissolved amount is	
	Lab Sample			result	greater than	Final
Fraction	ID	Field Sample ID	Analyte	(µg/L)	Total amount	Qualifier
Dissolved	360-39255-1	OC-ISCO3-SW	Sodium	88000	14.3%	J
Total	360-39255-1	OC-ISCO3-SW	Sodium	77000		J
Dissolved	360-39255-3	OC-SW-PZ16RR-SW	Aluminum	760	18.8%	J
Total	360-39255-3	OC-SW-PZ16RR-SW	Aluminum	640		J
Dissolved	360-39255-3	OC-SW-PZ16RR-SW	Sodium	170000	13.3%	J
Total	360-39255-3	OC-SW-PZ16RR-SW	Sodium	150000		J
Dissolved	360-39255-4	OC-SW-PZ-17RR-SW	Aluminum	1200	20.0%	J
Total	360-39255-4	OC-SW-PZ-17RR-SW	Aluminum	1000		J
Dissolved	360-39255-4	OC-SW-PZ-17RR-SW	Sodium	220000	15.8%	J
Total	360-39255-4	OC-SW-PZ-17RR-SW	Sodium	190000		J
Dissolved	360-39255-5	OC-SD-17-SW	Aluminum	890	14.1%	J
Total	360-39255-5	OC-SD-17-SW	Aluminum	780		J



	Lab Sample			Analyte result	% Dissolved amount is greater than	Final
Fraction	ID .	Field Sample ID	Analyte	(µg/L)	Total amount	Qualifier
Dissolved	360-39255-5	OC-SD-17-SW	Chromium	410	10.8%	J
Total	360-39255-5	OC-SD-17-SW	Chromium	370		J
Dissolved	360-39255-5	OC-SD-17-SW	Sodium	210000	16.7%	J
Total	360-39255-5	OC-SD-17-SW	Sodium	180000		J
Dissolved	360-39255-6	OC-PZ18R-SW	Sodium	120000	22.4%	J
Total	360-39255-6	OC-PZ18R-SW	Sodium	98000		J
Dissolved	360-39255-6	OC-PZ18R-SW	Aluminum	92	12.2%	J
Total	360-39255-6	OC-PZ18R-SW	Aluminum	82		J
Dissolved	360-39255-7	OC-ISCO1-SW	Sodium	120000	20.0%	J
Total	360-39255-7	OC-ISCO1-SW	Sodium	100000		J
Dissolved	360-39255-7	OC-ISCO1-SW	Aluminum	100	17.6%	J
Total	360-39255-7	OC-ISCO1-SW	Aluminum	85		J

3.0 GENERAL CHEMISTRY – Ammonia, Chloride, Sulfate, Nitrate, Nitrite, and Specific Conductance

Data were reviewed for the following parameters:

- Data Completeness
- * Holding Time
- * Blanks

Matrix Spike Analysis (sulfate and chloride in groundwater only)

- Field Duplicate Analysis
- Laboratory Duplicate Analysis
- Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
 Detection Limits
- * = indicates that criteria were met for this parameter

Matrix Spikes

SDG 360-39262-1

Sample OC-GW-202S was submitted for matrix spike analysis. The percent recoveries of sulfate (137) and chloride (126) were above the upper control of 125. The relative percent difference (RPD) between the percent recovery in the MS and MSD was 21 and above the control limit of 20. Results for chloride and sulfate were qualified estimated (J) in sample OC-GW-202S and the associated field duplicate, OC-GW-202SDUP.



Detection Limits

SDG 360-39255-1

Nitrite quantitation limits were reported above the project goal of 0.01 mg/L due to dilution in the following samples:

SDG	lab_sample_id	field_sample_id	param_name	final_result (mg/l)	Final Qual	dilution _factor
360-39255-1	360-39255-1	OC-ISCO3-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-2	OC-ISCO2-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-3	OC-SW-PZ16RR-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-4	OC-SW-PZ-17RR-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-5	OC-SD-17-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-6	OC-PZ18R-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-7	OC-ISCO1-SW	Nitrite as N	0.1	U	10

Unless discussed above, sample results are interpreted to be usable as reported by TestAmerica.

Chris Ricards	6/21/2012
Chris Ricardi, NRCC-EAC Senior Chemist	Date
Michael Murphy Project Principal	G(26(12 Date



References:

- American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, D.C. 20005.
- MACTEC Engineering and Consulting, Inc. (MACTEC), 2007. "Final Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; August 8.
- Massachusetts Department of Environmental Protection (MassDEP), 2010. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; July.
- U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).
- USEPA, 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

Table 1 Sample Summary Data Validation Report

February/March 2012 Slurry Wall / Cap Groundwater and Surface Water

Olin Chemical Superfund Site Wilmington, Massachusetts

Lab Sample ID	Location	Sample ID	Sample Date	SW846 6010C Total Metals	SW846 6010C Filtered Metals	E350.1 (QuickChem 10-107-06-1-B) Ammonia	A2510B Conductivity	40CFR136A 300.0 Anions
Groundwater								
360-39262-1	GW-202D	OC-GW-202D	2/22/2012		2	1	1	2
360-39262-2	GW-202S	OC-GW-202S	2/22/2012		2	1	1	2
360-39262-3	GW-202S	OC-GW-202S DUP	2/22/2012		2	1	1	2
360-39262-4	PZ-25	OC-PZ-25	2/22/2012		2	1	1	2
360-39262-5	PZ-24	OC-PZ-24	2/22/2012		2	1	1	2
360-39434-2	GW-79S	OC-GW 79S	3/7/2012		2	1	1	2
360-39434-3	PZ-16RR	OC-PZ 16RR	3/7/2012		2	1	1	2
360-39540-1	GW-78S	OC-GW-78S	3/12/2012		2	1	1	2
360-39540-2	PZ-17RR	OC-PZ-17-RR	3/12/2012		2	1	1	2
360-39540-3	GW-25	OC-GW-25	3/12/2012		2	1	1	2
360-39540-4	PZ-18R	OC-PZ-18R	3/12/2012		2	1	1	2
Surface Water								
360-39255-1	ISCO3	OC-ISCO3-SW	2/23/2012	3	3	1	1	4
360-39255-2	ISCO2	OC-ISCO2-SW	2/23/2012	3	3	1	1	4
360-39255-3	PZ-16RR	OC-SW-PZ16RR-SW	2/23/2012	3	3	1	1	4
360-39255-4	PZ-17RR	OC-SW-PZ-17RR-SW	2/23/2012	3	3	1	1	4
360-39255-5	SD-17	OC-SD-17-SW	2/23/2012	3	3	1	1	4
360-39255-6	PZ-18R	OC-PZ18R-SW	2/23/2012	3	3	1	1	4
360-39255-7	ISCO1	OC-ISCO1-SW	2/23/2012	3	3	1	1	4

Notes:

Number listed under method indicates number of target analytes reported.

Prepared by / Date: KJC 03/30/12 Checked by / Date: TLC 05/07/12

Table 2

Final Results Summary February/March 2012 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site Wilmington, Massachusetts

			Loc Name	GW-20	2D	GW-	202S	GW-	202S	GW	-25	GW-	78S	GW-79S		PZ-16RR		PZ-1	7RR
		Fi	eld Sample ID	OC-GW-2	202D	OC-GV	V-202S	OC-GW-	202SDUP	OC-GW-25		OC-GW-78S		OC-GW 79S		OC-PZ 16RR		OC-PZ	-17-RR
		Field	Sample Date	02/22/	12	02/2	2/12	02/2	2/12	03/1	2/12	03/1:	2/12	03/0	7/12	03/0	7/12	03/1	2/12
			QC Code	FS		F	S	F	D	F	S	F	S	F	S	F	3	F	S
		Lab Sample D	elivery Group	360-3926	62-1	360-39	9262-1	360-3	9262-1	360-39	9540-1	360-39	540-1	360-39	434-1	360-39	434-1	360-39	3540-1
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	14000		100	U	100	U	100	U	100	U	16	J	100	U	100	U
F	SW6010	Chromium	ug/l	980		3.3	J	3.4	J	3.1	J	5.1		5.6		5.3		5.1	
N	E300	Chloride	mg/l	280		47	J	46	J	69		27		180		130		22	
N	E300	Sulfate	mg/l	1800		360	J	350	J	100		490		1200		740		460	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	310		73		66		50		53		140		110		53	
Ν	A2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	4500		1100		1100		660		1300		3000		2100		1300	

Notes:

N = normal

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micromhos per centimeter

Table 2

Final Results Summary February/March 2012 Slurry Wall / Cap Groundwater and Surface Water **Olin Chemical Superfund Site** Wilmington, Massachusetts

		Loc Name			8R	PZ-	-24	PZ-	25
		Fie	OC-PZ-18R		OC-PZ-24		OC-P	Z-25	
		Field	03/12/12		02/22/12		02/22	2/12	
		QC Code			FS		S	FS	3
		Lab Sample Do	elivery Group	360-39	540-1	360-39	262-1	360-39	262-1
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	100	U	100	U	100	U
F	SW6010	Chromium	ug/l	14		23		8	
N	E300	Chloride	mg/l	290		26		19	
N	E300	Sulfate	mg/l	790		720		460	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	140		60		46	
N	A2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	2600		1900		1300	

KJC 05/08/12

TLC 05/10/12

Notes: Prepared by / Date: Checked by / Date:

N = normal

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micromhos per centimeter

Table 2 Final Results Summary February/March 2012 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site Wilmington, Massachusetts

			Loc Name	ISCO ²		ISC	O2	ISCO)3	PZ-16	RR	PZ-1	7RR	PZ-1	8R	SD-	17
			Field Sample ID	OC-ISCO1	-SW	OC-ISC	O2-SW	OC-ISCO	3-SW	OC-SW-PZ	16RR-SW	OC-SW-PZ	-17RR-SW	OC-PZ1	BR-SW	OC-SD-1	17-SW
			Field Sample Date	02/23/1	2	02/23	3/12	02/23	12	02/23	/12	02/23	3/12	02/23	3/12	02/23	/12
			QC Code	FS		FS	3	FS		FS	i	F	S	FS	3	FS	3
		Lab Sam	ple Delivery Group	360-3925	5-1	360-39	255-1	360-392	55-1	360-392	255-1	360-39	255-1	360-39	255-1	360-392	255-1
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	100 J		150		36 J		760 J	l	1200	J	92 、	J	890 J	J
F	SW6010	Chromium	ug/l	15		74		5 L	l	360		540		14		410 J	J
F	SW6010	Sodium	ug/l	120000 J		150000		88000 J		170000 J	l	220000	J	120000 、	J	210000 J	J
N	E300	Chloride	mg/l	140		130		140		160		220		140		210	
N	E300	Nitrate as N	mg/l	0.27		1.2		0.94		1.1		3.4		0.34		3.7	
N	E300	Nitrite as N	mg/l	0.1 U		0.1	U	0.1 L	ı	0.1 ไ	J	0.1	U	0.1 \	J	0.1 L	J
N	E300	Sulfate	mg/l	170		420		36		470		550		180		460	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	44		92		2.4		100		89		51		77	
N	A2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	970		1500		670		1600		2000		1000		1800	
Т	SW6010	Aluminum	ug/l	85 J		140		39 J		640 J	l	1000	J	82 、	J	780 J	J
Т	SW6010	Chromium	ug/l	15		73		0.68 J		340		510		14		370 J	J
Т	SW6010	Sodium	ug/l	100000 J		140000		77000 J		150000 J	l	190000	J	98000 、	J	180000 J	J

Prepared by / Date:

Checked by / Date:

KJC 03/16/12 TLC 05/10/12

Notes: N = normal

T = total (unfiltered)

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micromhos per centimeter

Table 3

Validation Qualification Action Summary

Data Validation Report

February/March 2012 Slurry Wall / Cap Groundwater and Surface Water Olin Chemical Superfund Site

Wilmington, Massachusetts

		Analytical				Lab	Lab	Final	Final	Val Reason	
SDG	Lab Sample ID	Method	Fraction	Field Sample ID	Parameter	Result	Qualifier	Result	Qualifier	Code	Units
360-39255-1	360-39255-1	SW6010	Т	OC-ISCO3-SW	Sodium	77000		77000	J	TD	ug/l
360-39255-1	360-39255-1	SW6010	F	OC-ISCO3-SW	Sodium	88000		88000	J	TD	ug/l
360-39255-1	360-39255-3	SW6010	F	OC-SW-PZ16RR-SW	Aluminum	760		760	J	TD	ug/l
360-39255-1	360-39255-3	SW6010	Т	OC-SW-PZ16RR-SW	Aluminum	640		640	J	TD	ug/l
360-39255-1	360-39255-3	SW6010	F	OC-SW-PZ16RR-SW	Sodium	170000		170000	J	TD	ug/l
360-39255-1	360-39255-3	SW6010	Т	OC-SW-PZ16RR-SW	Sodium	150000		150000	J	TD	ug/l
360-39255-1	360-39255-4	SW6010	Т	OC-SW-PZ-17RR-SW	Aluminum	1000		1000	J	TD	ug/l
360-39255-1	360-39255-4	SW6010	F	OC-SW-PZ-17RR-SW	Aluminum	1200		1200	J	TD	ug/l
360-39255-1	360-39255-4	SW6010	F	OC-SW-PZ-17RR-SW	Sodium	220000		220000	J	TD	ug/l
360-39255-1	360-39255-4	SW6010	Т	OC-SW-PZ-17RR-SW	Sodium	190000		190000	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	Т	OC-SD-17-SW	Aluminum	780		780	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	F	OC-SD-17-SW	Aluminum	890		890	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	F	OC-SD-17-SW	Chromium	410		410	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	Т	OC-SD-17-SW	Chromium	370		370	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	Т	OC-SD-17-SW	Sodium	180000		180000	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	F	OC-SD-17-SW	Sodium	210000		210000	J	TD	ug/l
360-39255-1	360-39255-6	SW6010	F	OC-PZ18R-SW	Aluminum	92	J	92	J	TD	ug/l
360-39255-1	360-39255-6	SW6010	Т	OC-PZ18R-SW	Aluminum	82	J	82	J	TD	ug/l
360-39255-1	360-39255-6	SW6010	Т	OC-PZ18R-SW	Sodium	98000		98000	J	TD	ug/l
360-39255-1	360-39255-6	SW6010	F	OC-PZ18R-SW	Sodium	120000		120000	J	TD	ug/l
360-39255-1	360-39255-7	SW6010	F	OC-ISCO1-SW	Aluminum	100		100	J	TD	ug/l
360-39255-1	360-39255-7	SW6010	Т	OC-ISCO1-SW	Aluminum	85	J	85	J	TD	ug/l
360-39255-1	360-39255-7	SW6010	Т	OC-ISCO1-SW	Sodium	100000		100000	J	TD	ug/l
360-39255-1	360-39255-7	SW6010	F	OC-ISCO1-SW	Sodium	120000		120000	J	TD	ug/l
360-39262-1	360-39262-2	E300	N	OC-GW-202S	Chloride	47		47	J	MS-H	mg/l
360-39262-1	360-39262-2	E300	N	OC-GW-202S	Sulfate	360		360	J	MS-H	mg/l
360-39262-1	360-39262-3	E300	N	OC-GW-202SDUP	Chloride	46		46	J	MS-H	mg/l
360-39262-1	360-39262-3	E300	N	OC-GW-202SDUP	Sulfate	350		350	J	MS-H	mg/l

Units:

ug/L = microgram per liter mg/L = milligram per liter

Fraction

Feb-Mar 2012 SWC Tables 2+3, Table 3

T = Total F = Filtered

N = Not Applicable

Validation Qualifier:

J = Value is estimated

Validation Reason Codes:

MS-H = MS and/or MSD recovery high

TD = Dissolved concentration exceeds total concentration by greater than ten percent

Prepared by / Date:

Checked by / Date:

KJC 03/16/12

TLC 05/10/12

Version 1.3, Oct 2011

OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Reviewer/Date_ Sr. Review/Date_	Tige Lunai	nglesan	3-14-	-1.2
Sr. Review/Date_	Unis	Ricard	161	7/12
Lab Report #	360-39	1255-1	360-	39262.1.
Project#	071200	16.0	(. <u>10</u>	

1.0 Laboratory Deliverable Requirements 1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes No No NA NA Check items received. ✓ Address ✓ Project ID ✓ Phone # ✓ Name ✓ Address ❤ Client Contact Sample identification – Field and Laboratory ✓ Name of Laboratory Client Information: (IDs must be cross-referenced) **ACTION**: If no, contact lab for submission of missing or illegible information. 1.2 Laboratory Report Certification Statement Yes | No | 1 N/A | 1 Comments: Does the laboratory report include a completed Analytical Report Certification in the required format? ACTION: If no, contact lab for submission of missing certification or certification with correct format. Yes [No [] N/A [] 1.3 Laboratory Case Narrative: Narrative serves as an exception report for the project and method QA/QC performance. ☐ Narrative includes an explanation of each discrepancy Certification Statement. ACTION: If no, contact lab for submission of missing or illegible information. Yes [No N/A N/A 1.4 Chain of Custody (COC) copy present with all documentation completed **NOTE:** Olin receives and maintains the *original COC*. **ACTION**: If no, contact lab for submission of copy of completed COC. P:\Projects\olinwilm\Data Validation\DV checklists\2011 Revisions\6010.doc

1 of 10

1.5 Sample	Receipt Information (Cooler Receipt Form present?):	Yes [🗸	No[]	N/A []	Comments:
Were each o into the labor	of the following tasks completed and recorded upon receipt of the sample(s) ratory?		_		
☑ Sample temperature ☑ Container type note	e confirmed: must be $1^{\circ} - 10^{\circ}$ C. (If samples were sent by courier and delivered at sample condition observed \square pH verified (where applicable) \square Field and	on the same	day as colle oss referenc	ection, temper	ature requirement does not apply).
ACTION: If no, conta	act lab for submission of missing or incomplete documentation.				
1.5.1	Were all samples delivered to the laboratory without breakage?	Yes 🚺	No []	N/A []	Comments:
1.5.2	Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	Yes []	No 🗹	/ N/A []	Comments:
	Results Section: Was each of the following requirements supplied in the ry report for each sample?	Yes 🚺	No []	N/A []	Comments:
Field ID and Lab Clean-up method Matrix	Analysis method Preparation method	Dilution Date of puts (soils mus	oreparation/	/extraction/dig d in dry weigh	moisture or solids Reporting limit estion clean-up and analysis, where applicable at)
ACTION: If no, con	tact lab for submission of missing or incomplete information.				
1.7 QA/QC laboratory rep	Information: Was each of the following information supplied in the port for each sample batch?	Yes 🗾	No [_]	N/A []	Comments:

6010

/		/				
Met Met	thod blank	c results LCS recoveri	es MS/MSD recoveries and RPD	Laboratory duplicate res	sults (where applicable)	
ACTIO	ON: If no	, contact lab for submission	of missing or incomplete information.			
					•	
2.0	<u>Holdin</u>	g Times				
Have a		ed? Holding time for metal	ned from date of collection to date of and s is 180 days from sample collection to analy		No N/A	Comments:
NOTE	: List sam	aples that exceed hold time	vith # of days exceeded on checklist			
ACTI(xceeded, qualify all positive results (J) and ing time) reject (R) all non-detect results.	non-detects		
3.0	<u>Labor</u>	atory Method	·			
	3.1	Was the correct laborate	ory method used?	Yes 🗾	No [_] N/A [_]	Comments:
		Water Digestion Soil Digestion Metals	3005A or 3010A or 3020A 3050B 6010B or 200.7		•	
com	pared to		ry to provide justification for metho Contact senior chemist to inform Client	_		
	3.2	Are the practical quan	itation limits the same as those specific P Lab MADEP	ied by the Yes	No [] N/A []	Comments:
NOT	TE: Verify	that the reported metals ma	atch the target list specified on the COC.			

ACTION : If no, evaluate variation with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.								
3.3	Are results present for each sample in the SDG?	Yes [No [_]	N/A []	Comments:			
ACTION: 1	If no, check Request for Analysis to verify if method was ordered and COC to verify that it	t was sent, an	ıd contact la	b for resubmis	ssion of the missing data			
3.4	If dilutions were required, were dilution factors reported?	Yes 🔽	No [_]	N/A []	Comments:			
ACTION: 1	If no, contact the lab for submission.							
4.0 <u>M</u>	ethod Blanks							
4.1	Is the Method Blank Summary present?	Yes 🗹	No [_]	N/A []	Comments:			
ACTIO!	N: If no, call the laboratory for submission of missing data.	•						
4.2	Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?	Yes 🔽	No [_]	N/A []	Comments:			
	N: If no, contact laboratory for justification. Consult senior chemist for action Narrate non-compliance.							
4.3	Is the method blank less than the PQLs for all target elements?	Ves [🗸	No I	N/A []	Comments:			
NOTE: samples	MADEP requires the method blank to be matrix matched and digested with the	105	1,0					
4. 4 the	Do any method blanks have positive results for metals? Qualify data according to following:	Yes [_]	No 🗾	N/A []	Comments:			

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

5.1	Was a laboratory control standard run with each analytical batch of 20 samples or less?	Yes 🗹	No []	N/A []	Comments:
ACTION:	target, second source LCS is required by MADEP. Call laboratory for LCS form submittal. If data are not available, use udgement to evaluate data accuracy associated with that batch.				
5.2	Is a LCS Summary Form present?	Yes 🗹	No [_]	N/A []	Comments:
ACTION: If	no, contact lab for resubmission of missing data.			/	
5.3	Is the recovery of any analyte outside of MADEP control limits? MADEP	Yes []	No 🗹	N/A []	Comments:
Sample	Type % Rec				
Water	80-120				
Soil	within Lab generated limits				
ACTION:	f recovery is above the upper limit, qualify all positive sample results				
	tch as (J). If recovery is below the lower limit, qualify all positive and				
	esults within the batch as (J). If LCS recovery is <30%, positive and non-				
	are rejected (R).				

Comments:

OLIN CORPORATION

LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked.

Yes No N/A Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

Yes No No N/A Comments:

NOTE: A <u>full</u> target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

Yes No No N/A Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits?

Yes [1	No [1	N/A [🗸]	Comments:

	MADEP	QAPP	
Sample Type	% Rec	% Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE:
$$%R = (SSR-SR) \times 100\%$$

Where: SSR = Spiked sample resultSR = Sample result

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits?

Yes No No N/A Comments:

NOTE: RPD = S-D x 100% (S+D)/2

Where: S = MS sample result D = MSD sample result

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Laboratory Duplicate

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Yes [] No [N/A [] Comments Duplicate Sample Form present?

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

Yes [_]	No 🗹	N/A []	Comments				

MADEP Laboratory Duplicate Sample RPD Criteria:	QAPP RPL
For aqueous results > $5 \times$ RL, RPD must be $\pm 20\%$	20
For aqueous results < 5x RL, RPD must be ≤ RL	20
For soil/sediment results > $5 \times$ RL, RPD must be $\pm 35\%$	20
For soil/sediment results < $5 \times$ RL, RPD must be $\leq 2 \times$ RL	20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 <u>Sampling Accuracy</u>

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

- **8.1** Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.
- **8.2** Do any rinsate blanks have positive results?

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes No No N/A Comments:

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9.2 Were field duplicates collected per t	he required frequency?	Yes 🚺	No [_] N/A [_]	Comments:				
SOW □ QAPP (1 per 10) □ MADEP Op	otion 1 (1 per 20) ☐ MADEP Option 3 (1 per 10)	□ .						
9.3 Was the RPD \leq 50% for soils or attach to this review.	waters? Calculate the RPD for all results as	ad Yes	No [] N/A []	Comments:				
ACTION : RPD must be ≤50% for soil and v	water. Qualify data (J) for both sample resul	ts if the RPD	exceeds 50%.					
10.0 Special QA/QC								
10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal. ACTION: If results for both total and dissolved are ≥ 5x the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL and the difference exceeds 2x the PQL, flag both results as estimated (J)								
	Sample Total So. OC-ISCO3-SW 77000	dium Dissolved 88000	6/6 Dissolved W	isher <u>Oval</u> Both				
	0 C-ISCOZ-SW 140000	150000	7%	pore				
	0 C- SW-PZIGER-SW 15000C	170000	13%	Javal Both				
	OC-5W-PZ-17RRSW 190000	720000	15%	Javal Both				
	Coe	rHacked	table emainder of sauf					
6010	Sea	for a	e mainer samp	U S				

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					% Dissolved amount	
				Analyte result	is greater than Total	Final
fraction	Lab Sample ID	Field Sample ID	Analyte	(µg/L)	amount	Qualifier
Dissolved	360-39255-1	OC-ISCO3-SW	Sodium	88000	14.3%	J
Total	360-39255-1	OC-ISCO3-SW	Sodium	77000		J
Dissolved	360-39255-3	OC-SW-PZ16RR-SW	Aluminum	760	18.8%	J
Total	360-39255-3	OC-SW-PZ16RR-SW	Aluminum	640		J
Dissolved	360-39255-3	OC-SW-PZ16RR-SW	Sodium	170000	13.3%	J
Total	360-39255-3	OC-SW-PZ16RR-SW	Sodium	150000		J
Dissolved	360-39255-4	OC-SW-PZ-17RR-SW	Aluminum	1200	20.0%	J
Total	360-39255-4	OC-SW-PZ-17RR-SW	Aluminum	1000		J
Dissolved	360-39255-4	OC-SW-PZ-17RR-SW	Sodium	220000	15.8%	J
Total	360-39255-4	OC-SW-PZ-17RR-SW	Sodium	190000		J
Dissolved	360-39255-5	OC-SD-17-SW	Aluminum	890	14.1%	J
Total	360-39255-5	OC-SD-17-SW	Aluminum	780		J
Dissolved	360-39255-5	OC-SD-17-SW	Chromium	410	10.8%	J
Total	360-39255-5	OC-SD-17-SW	Chromium	370		J
Dissolved	360-39255-5	OC-SD-17-SW	Sodium	210000	16.7%	J
Total	360-39255-5	OC-SD-17-SW	Sodium	180000		J
Dissolved	360-39255-6	OC-PZ18R-SW	Sodium	120000	22.4%	J
Total	360-39255-6	OC-PZ18R-SW	Sodium	98000		J
Dissolved	360-39255-7	OC-ISCO1-SW	Sodium	120000	20.0%	J
Total	360-39255-7	OC-ISCO1-SW	Sodium	100000		J

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Lab Sample ID: 360-39255-1

Matrix: Water

Client Sample ID: OC-ISCO3-SW
Date Collected: 02/23/12 07:20

Date Received: 02/23/12 16:45

Method: 6010C - Metals (ICP)

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Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	39	J	100	13	ug/L		02/24/12 09:45	02/27/12 12:54	1
Chromium	0.68	J	5.0	0.66	ug/L		02/24/12 09:45	02/27/12 12:54	1
Sodium	77000	7	2000	780	ug/L		02/24/12 09:45	03/06/12 15:47	1
- Method: 6010C - Metals (ICP) - D	issolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	36	J	100	13	ug/L			03/06/12 16:39	1
Chromium	ND		5.0	0.66	ug/L			03/06/12 16:39	1
Sodium	88000	J	2000	780	ug/L			03/06/12 16:39	1
General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.94		0.050	0.050	mg/L			02/24/12 16:53	1
Sulfate	36		2.0	2.0	mg/L			02/24/12 16:53	1
Chloride	140		10	10	mg/L			02/24/12 17:10	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 17:10	10
Ammonia	2.4	•	0.10	0.10	mg/L		02/27/12 10:48	02/27/12 15:34	1
Specific Conductance	670		1.0	1.0	umhos/cm			03/01/12 09:29	1
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Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Lab Sample ID: 360-39255-3

Matrix: Water

Client Sample ID: OC-SW-PZ16RR-SW

Date Collected: 02/23/12 08:00 Date Received: 02/23/12 16:45

Method: 6010C - Metals (ICP)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	640	7	100	13	ug/L		02/24/12 09:45	02/27/12 13:00	1
Chromium	340		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:00	1
Sodium	150000	J	2000	780	ug/L		02/24/12 09:45	03/06/12 15:54	1

Method: 6010C - Metals (ICP) - Dissolved										
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Aluminum	760	J	100	13	ug/L			03/06/12 16:51	1
	Chromium	360		5.0	0.66	ug/L			03/06/12 16:51	1
	Sodium	170000	5	2000	780	ug/L			03/06/12 16:51	1

General Chemistry Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	1.1		0.050	0.050	mg/L			02/24/12 18:02	1
Sulfate	470		20	20	mg/L			02/24/12 18:53	10
Chloride	160		10	10	mg/L			02/24/12 18:53	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 18:53	10
Ammonia	100		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:53	10
Specific Conductance	1600		1.0	1.0	umhos/cm			03/01/12 09:32	1
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Client: Olin Corporation

Date Collected: 02/23/12 08:20

Date Received: 02/23/12 16:45

Project/Site: Olin Chemical Surface water Quarterly

Client Sample ID: OC-SW-PZ-17RR-SW

TestAmerica Job ID: 360-39255-1

Lab Sample ID: 360-39255-4

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Method: 6010C - Metals (ICP)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1000	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:09	1
Chromium	510		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:09	1
Sodium	190000	J	2000	780	ug/L		02/24/12 09:45	03/06/12 15:57	1

Method: 6010C - Metals (ICP) - Dissolved										
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Aluminum	1200	J	100	13	ug/L			03/06/12 16:54	1
	Chromium	540		5.0	0.66	ug/L			03/06/12 16:54	1
	Sodium	220000	T	2000	780	ug/L			03/06/12 16:54	1

Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
3.4		0.050	0.050	mg/L			02/24/12 19:10	1
550		20	20	mg/L			02/24/12 19:27	10
220		10	10	mg/L			02/24/12 19:27	10
ND		0.10	0.10	mg/L			02/24/12 19:27	10
89		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:54	10
2000		1.0	1.0	umhos/cm			03/01/12 09:33	1
	3.4 550 220 ND 89	550 220 ND 89	3.4 0.050 550 20 220 10 ND 0.10 89 1.0	3.4 0.050 0.050 550 20 20 220 10 10 ND 0.10 0.10 89 1.0 1.0	3.4 0.050 0.050 mg/L 550 20 20 mg/L 220 10 10 mg/L ND 0.10 0.10 mg/L 89 1.0 1.0 mg/L	3.4 0.050 0.050 mg/L 550 20 20 mg/L 220 10 10 mg/L ND 0.10 0.10 mg/L 89 1.0 1.0 mg/L	3.4 0.050 0.050 mg/L 550 20 20 mg/L 220 10 10 mg/L ND 0.10 0.10 mg/L 89 1.0 1.0 mg/L 02/27/12 10:48	3.4 0.050 0.050 mg/L 02/24/12 19:10 550 20 20 mg/L 02/24/12 19:27 220 10 10 mg/L 02/24/12 19:27 ND 0.10 0.10 mg/L 02/24/12 19:27 89 1.0 1.0 mg/L 02/27/12 10:48 02/27/12 15:54



Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

Client Sample ID: OC-SD-17-SW

Date Collected: 02/23/12 08:45

Date Received: 02/23/12 16:45

TestAmerica Job ID: 360-39255-1

Lab Sample ID: 360-39255-5

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	Method: 6010C - Metals (ICP)									
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Aluminum	780	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:12	1
	Chromium	370	J	5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:12	1
	Sodium	180000	J	2000	780	ug/L		02/24/12 09:45	03/06/12 16:00	1
1	_									
	Method: 6010C - Metals (ICP) - Dis	solved								
	Δnalyte	Result	Qualifier	RI	MDI	Unit	D	Prenared	Analyzed	Dil Fac

Method: 6010C - Metals (ICP) - Dissolved										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Aluminum	890	J	100	13	ug/L			03/06/12 16:57	1	
Chromium	410	J	5.0	0.66	ug/L			03/06/12 16:57	1	
Sodium	210000	5	2000	780	ug/L			03/06/12 16:57	1	

General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	3.7		0.050	0.050	mg/L			02/24/12 19:44	1
Sulfate	460		20	20	mg/L			02/24/12 20:01	10
Chloride	210		10	10	mg/L			02/24/12 20:01	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 20:01	10
Ammonia	77		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:55	10
Specific Conductance	1800		1.0	1.0	umhos/cm			03/01/12 09:35	1

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

Client Sample ID: OC-PZ18R-SW

Date Collected: 02/23/12 08:55 Date Received: 02/23/12 16:45 TestAmerica Job ID: 360-39255-1

Lab Sample ID: 360-39255-6

Method: 6010C - Metals (ICP)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	82	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:15	1
Chromium	14		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:15	1
Sodium	98000	J	2000	780	ug/L		02/24/12 09:45	03/06/12 16:03	1

		V							
Method: 6010C - Metals (ICP) - Diss	olved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	92	J	100	13	ug/L			03/06/12 17:00	1
Chromium	14		5.0	0.66	ug/L			03/06/12 17:00	1
Sodium	120000	T	2000	780	ug/L			03/06/12 17:00	1

- 1										
	General Chemistry									
	Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Nitrate as N	0.34		0.050	0.050	mg/L			02/24/12 20:19	1
	Sulfate	180		20	20	mg/L			02/24/12 20:36	10
	Chloride	140		10	10	mg/L			02/24/12 20:36	10
	Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 20:36	10
	Ammonia	51		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:56	10
	Specific Conductance	1000		1.0	1.0	umhos/cm			03/01/12 09:36	1
- /1										



Client: Olin Corporation

Sodium

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Lab Sample ID: 360-39255-7

03/06/12 17:03

Matrix: Water

Client Sample ID: OC-ISCO1-SV	V
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Date Collected: 02/23/12 09:05 Date Received: 02/23/12 16:45

	Method: 6010C - Metals (ICP)									
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Aluminum	85	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:18	1
	Chromium	15		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:18	1
	Sodium	100000	J	2000	780	ug/L		02/24/12 09:45	03/06/12 16:06	1
1										
	Method: 6010C - Metals (ICP) - Dissolve	ed								
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Aluminum	100	7	100	13	ug/L			03/06/12 17:03	1
	Chromium	15		5.0	0.66	ug/L			03/06/12 17:03	1

General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.27		0.050	0.050	mg/L			02/24/12 20:53	1
Sulfate	170		20	20	mg/L			02/24/12 21:10	10
Chloride	140		10	10	mg/L			02/24/12 21:10	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 21:10	10
Ammonia	44		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:57	10
Specific Conductance	970		1.0	1.0	umhos/cm			03/01/12 09:45	1

2000

780 ug/L

120000

10.0	Application	of Validation	Oualifiers

Was any of the data qualified?

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

See Total VS. Dissolved
Comparison

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- MADEP, 2010. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data in Support of Action Conducted Under the Massachusetts Contingency Plan (MCP)," WSC-CAM, Section VIIA, Final, Revision No. 1, 1 July 2010.
- MADEP, 2010. "Quality Control Requirements and Performance Standards for the Analysis of Trace Metals by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) in Support of Response Actions under the Massachusetts Contingency Plan (MCP)" WSC-CAM, Final, Revision No. 1, 5 July 2010.

Version 3, October 2008

OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date 19e Cunninghom 3-14-12
Sr. Review/Date
Lab Report #360 - 39255-1 360-39262-1
Project # 6(07/200(6.0), 10

<u>360-39434</u>-1, 300-39540-1

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

	not define criteria, QA/QC				is lit, official will c	ioladit to various st	aparated in the Q2111. Wi	iore ine (
1.0	Laboratory Deliverable R	equirements						
	1.1 Laboratory Informati Check items received.	on: Was all of the	following provided	in the laboratory report?	Yes No [N/A [_]	Comments:	
	■ Name of Laboratory	☑ Address	☑ Project ID	☐ Phone #	Sample ident	ification – Field an	nd Laboratory	
	Client Information:	Name	Address	Client Contact	(IDs must be cros		·	
ACTI	ON: If no, contact lab for	submission of mi	ssing or illegible in	nformation.				
	1.2 Laboratory Report	t Certification St	atement		Yes Mo		Comments:	
	Does the laboratory repo	ort include a comp	leted Analytical Re	port Certification in the I	required format?			
ACTIC	DN : If no, contact lab for su	ıbmission of missi	ng certification or c	ertification with correct	format.			
	1.3 Laboratory Case N	larrative:			Yes / No [Comments:	
	Narrative serves as al	n exception report f	or the project and me	ethod QA/QC performance		includes an expla n Statement.	nation of each discrepanc	y on the
ACTIC	DN : If no, contact lab for su	ubmission of missi	ng or illegible infori	mation.				
	1.4 Chain of Custody (C	COC) copy present v	vith all documentation	on completed?	Yes 🚺 No [N/A	Comments:	
	Does the laboratory report	include copies of C	nain of Custody form	s containing all samples in	1 this SDG?			
	NOTE: Olin receives and n	maintains the <i>origin</i>	al COC.					
ACTIO	ON: If no, contact lab for sub	mission of copy of	missing completed C	OC.				
	1.5 Sample Receipt Infor	mation (Cooler F	Receipt Form): We	ere each of the following				

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

	Yes 🗾	No []	N/A []	Comments:
Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on	n the same d	ay as collecti	on, temperatu	re requirement does not apply).
Container type noted Condition observed pH verified (where applicable) Field and lab II	Os cross refer	renced		
ACTION: If no, contact lab for submission of missing or incomplete documentation. 1.5.1 Were the correct bottles and preservatives used?	Ves [1	No[]	N/A 「 1	Comments:
Ammonia,—1 Liter polyethylene/H ₂ SO ₄ to pH<2,cool to 4°C Oil & Grease – 1 Liter glass/HCL or H2SO4 to pH<2,cool to 4°C	105		14/11	Comments.
Alkalinity – 1 Liter polyethylene/cool to 4°C Chemical Oxygen Demand – 50 mL polyethylene/H ₂ SO ₄ to pH<2,cool to 4°C				
Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C Nitrate/nitrite - H2SO4 to pH<2,cool to 4°C				
Organic Carbon – 500 mL amber glass bottle/HCl or H_2SO_4 to pH<2,cool to 4°C Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C				
Phenolics - H ₂ SO ₄ to pH<2,cool to 4°C				
ACTION: If no, inform senior chemist. Document justification for change in				
container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment	_			
1.5.2 Were all samples delivered to the laboratory without breakage?	Yes [No []	N/A [_]	Comments:
1.5.3 Does the <i>Cooler Receipt Form</i> or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	Yes []	No 🗹	N/A []	Comments:

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		Sample Result eport for each s	ts Section: Was the sample?	following info	ormation supplied in	the laboratory	Yes 🔼	No []	N/A [_]	Comments:		-
Fie Clea	eld ID an	nd Lab ID nethod M/A	Date and time Analysis method	collected	Analyst Initia		Dilution l		/digestion clea	N/A oisture or solids an-up and analysis	s, where ap	Reporting limits plicable
☑ Mat	rix		Target analytes an	d concentration	ons	Unit	s (soils must	be reported:	in dry weight)			
ACTIO	ON: If	no, contact lab	for submission of mis	sing or incom	plete information.							
₽ Met	for ea	ch sample bate	ation: Was the followh?				-		N/A []	Comments:		
			for submission of miss			_ Bacoratory	auphouse ros	uno (whore t	ippinouoio)			
2.0	<u>Holdi</u>	ing Times		•			Yes [V]	No [_]	N/A]	Comments:		
	Have	any technical	holding times, determ	ined from dat	te of collection to dat	e of analysis, b	een exceede	d? The hold	ling times are	as follows:		
		28 days = amr	nonia, chemical oxyg	en demand, cl	hloride, organic carbo	on, oil & greas	e, specific co	nductance,	total organic c	arbon and sulfate	;	
		Alkalinity = 1	4 days	Sulfide, T	TDS, TSS = 7 days	pH = a	nalyze imme	diately	Nitrate	e nitrogen as N =	48 hrs	
		Nitrite nitroge	n as N = 48 hrs	Nitrate +	Nitrite as $N = 28$ day	rs .						
	NOT	E: List samples	s that exceed hold time	with # of day	ys exceeded on checkl	ist						
		technical hold to qualify soils	ing times are exceede	ed qualify res	ults (J). For water sa	mples that are		,	, ,	. ,	etect result	s. Professional
	3.0	Laboratory	Method				Yes 🗾	No []	N/A []	Comments:		
	3.1 W	as the correct l	aboratory method use	d?								
A CTIC	N· If n	o contact lab to	o provide justification	for method cl	hange compared to the	requested met	hod Contact	senior chem	niet to inform (Tient of change of	r to request	t variance

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	3.2 Are the practical quantitation ☐ QAPP/IRSWP ☐ Lab?	limits the same as those speci	ified by the Yes No No N/A	Comments:		
	Note: The MADEP QA/QC Guidelines therefore all criteria will default to values define criteria, QA/QC requirements de may also apply.	stipulated in the QAPP*. Where the Q	APP does not			
	Ammonia* ■ = 0.1 mg/ L	Alkalinity** $\square = 1 \text{ mg/L}$	Bicarbonate Alkalinity** $\square = 1 \text{ mg/L}$	Carbonate Alkalinity** $\square = 1 \text{ mg/L}$		
	Nitrate Nitrogen as N* 🗹 = .05 mg/L	Nitrite Nitrogen as N* ■ = .01 m	ng/L Chloride* ≥ 1 mg/L	Hardness $*\Box = 2 \text{ mg/L}$		
	Spec. Cond.** 2 3 umhos/cm	Total Organic Carbon** □ = 1 n	ng/L Oil & Grease* $\square = 5.5 \text{ mg/L}$	Sulfate (EPA 300.0)* □ = 2 mg/		
	COD:* Low – 20 mg/L	COD* High - 50 mg/L □	$TDS* \square = 10 \text{ mg/L}$	TSS* $\mathbf{E} = 5 \text{ mg/L}$		
	$pH* \square < 2 \text{ to} > 12$	Phenolic - 0.01 mg/L				
	Other parameter(list)	PQL=	☐ Source of PQL =	····		
	Other parameter(list)	PQL =	☐ Source of PQL =			
	3.3 Are the appropriate parameter results	s present for each sample in the SDG?	•	Comments:		
ACTI	ON: If no, check Request for Analysis to ve	erify if method was ordered and COC t	to verify that it was sent, and contact lab for resubmiss	ion of the missing data		
	3.4 If dilutions were required, were dilutions	on factors reported?	Yes No No N/A	Comments:		
ACTI	ON: If no, contact the lab for submission.					
4.0	Method Blanks		Yes	Comments:		
	4.1 Are the Method Blank Summaries pr	resent?				
ACTI	ON: If no, call the laboratory for submission	on of missing data.				
	4.2 Was a method blank analyzed for ea 20 or less?	ach analysis batch of wet chemistry field	Id samples of Yes No No N/A	Comments:		

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ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed. Yes | No | N/A |] 4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs). Comments: 4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data Comments: according to the following: If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL. If the sample concentration is $> 5 \times$ blank value, no qualification is needed. ACTION: If any blank has positive results, list all the concentrations detected and flagging level = 5 × blank value) on the checklist. List all affected samples and their qualifiers. 5.0 **Laboratory Control Standards** Was a laboratory control standard (LCS) run with each analytical batch of 20 Yes [No [] 5.1 Comments: samples or less? ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch. Yes No | N/A | 1 Is a LCS Summary Form present? 5.2 Comments: **ACTION**: If no, contact lab for resubmission of missing data. 5.3 Is any wet chemistry analyte LCS recovery outside the control limits? Comments:

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LCS Limits:

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(Alkalinity** $\square = 80\text{-}120\%$ Total Organic Carbon** $\square = 80\text{-}120\%$ COD Low* $\square = 80\text{-}120\%$ Hardness* $\square = 80\text{-}120\%$	Bicarbonate Alkalinity** $\square = 80\text{-}120\%$ TDS** $\square = 80\text{-}120\%$ COD High* $\square = 80\text{-}120\%$ Chloride* $\blacksquare = 80\text{-}120\%$	Carbonate Alkalinity** I Oil & Grease* □ = 80- Nitrate Nitrogen as N Sulfate (EPA 300.0)* ■	120% [**• 80-120%	Specific Conductivity * \blacksquare = 80-120% Ammonia Nitrogen as N* \blacksquare = 80-120% Nitrite Nitrogen as N** \blacksquare = 80-120% pH* \square = 98-102% TSS* NA		
1	Other parameter(list)	%R=		Rec Limits=			
1	Other parameter(list)	%R =		Rec Limits =			
		(MADEP has not yet defined LCS recov	ery limits for wet chemis	stry analyses.)			
vithin the	I: If recovery is above the upper limit, e batch as (J). If LCS recovery is <10%. Matrix Spikes	qualify all positive sample results within the , non-detect results are rejected (R).	batch as (J). If recovery i	is below the lower lin	nit, qualify all po	sitive and no-detect results	
		requencies based on monthly, quarterly, ents for each set with the senior chemist.					
		s analyzed? List project samples that were sp	oiked.	TO NIA F. 1	Commonto	Far 260-39262-1	
	N: If no, contact senior chemist to see if		res v no	N/A	Comments:	only (GW) Sulfate/	
	6.2 Is the MS/MSD Recovery Form I: If no, contact lab for resubmission of	*	Yes 💟 No	N/A N/A	Comments:	For 360-39262-1 only (GW) Sulfatel e hloride onl	
	·	at the required frequency of 1 per 20 samp		(c)	Comments:		
ACTION	V: If any matrix spike data is missing, ca	all lab for resubmission.			ď		
			Yes [] No	N/A N/A	Comments:		

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OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION

STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

	6.4	Are any wet c	hemistry a	nalyte	spike	recover	ies ou	utside of the C	C limits?											
		NOTE:	%R	=	(SSR-	SR)	x	100%					W	here:	S	SSR	=	Spiked	sample	result
			SA					SA = Spike a	added									SR	= Sampl	e result
	MS/MS	SD Recovery L	<u>imits:</u>																	
	Alkalin	ity* = NA				Bicarbo	onate	Alkalinity* =	NA	Carbon	ate alkali	nity* = N	A	A	mmonia	a* (LA	CHA	Γ) $\square = 75$	5-125%	
	Chlorid	e*(SM 4500 Cl) □= 75-1	25%		Specific	c Con	ductivity * =	NA	Total (Organic C	arbon* =	NA	T	DS** =	= NA				
Oil & Grease* = NA				COD Low* $\Box = 75-125\%$				COD High* $\Box = 75-125\%$												
	Nitrite 1	Nitrogen as N**	□ = 75-1	25%		Hardne	ess* 🗆] = 75-125%	Chlori	4 Sulfate	(EPA 30	0.0)*	= 75-12	25% p	$H^* = N$	ΙA		TSS*	= NA	
	Other parameter(list)									□ Rec Limits =										
qualify 1	NOTES N: MS/N positive r	S: 1) If only one 2) If the MS/I MSD flags only results as estimatory is < 30% and	MSD was apply to that apply to the apply to	coverion perform the san of the recovery the san of the recovery the r	es for a med by aple sp	an MS/N y the lab iked. D ies of th	MSD corate	ory on a non-p t evaluate if sa S and MSD a	of the con project samp ample conc	trol limit ple, no que entration an the lo	s, no qual ualificatio is > 4X s wer contro	ification in is requipile. If the	s neces red. ne recov	sary. U	Jse prof	ession S and	al judg MSD	gment for exceed th	e upper con	trol limit,
	ed, but no 6.5 Are	oratory control I of flags are applied any RPDs for More RPD = $\frac{S-I}{(S+D)}$	ed. MS/MSD r D x 100	recove	ries ou	tside of	the C	QA/QC limits		nal calibi	Yes V	7	tions ar	N/A	X.	Com	gh sam	:	entrations, t	ne data is
	MS/MS	SD RPD Limits ≤20	<u>u</u>							Sul	fate	137		90	0%	2	0			
7.0	Labora	ntory Duplicate	!												, /					

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Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

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Yes No No N/A

comments:
Only for Specific
Conductivity

QC Sample Results

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: Method Blank

Analyzed

03/02/12 11:06

03/02/12 11:06

Client Sample ID: OC-GW-202S

Client Sample ID: OC-GW-202S

Client Sample ID: Lab Control Sample

Prepared

Prep Type: Total/NA

Dil Fac

Method: 300.0 - Chloride & Sulfate (Continued)

Lab Sample ID: LCS 360-87944/6 Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total/NA Analysis Batch: 87944 LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit %Rec Limits Chloride 40.0 40.5 mg/L 101 85 - 115

Lab Sample ID: MB 360-87947/3 Matrix: Water

Analysis Batch: 87947

MB MB Analyte Result Qualifier RL RL Unit Prepared Analyzed Dil Fac Sulfate 2.0 2.0 ND ma/L 02/28/12 16:59 Chloride ND 1.0 1.0 mg/L 02/28/12 16:59

Lab Sample ID: LCS 360-87947/4 Matrix: Water

Analysis Batch: 87947

Spike LCS LCS %Rec Analyte Added Result Qualifier Unit D %Rec Limits Sulfate 80.0 81.6 mg/L 102 85 - 115 40.0 Chloride 40.8 mg/L 102 85 - 115

Lab Sample ID: MB 360-88087/3

Matrix: Water

Analysis Batch: 88087

MB MB

Analyte Result Qualifier RL RL Unit Sulfate ND 2.0 2.0 mg/L Chloride ND 1.0 1.0 mg/L

Lab Sample ID: LCS 360-88087/4

Matrix: Water

Analysis Batch: 88087

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D %Rec Limits Sulfate 80.0 81.4 mg/L 102 85 - 115 Chloride 40.0 40.7 mg/L 102 85 - 115

Lab Sample ID: 360-39262-2 MS

Matrix: Water

Analysis Batch: 88087

Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits Sulfate 360 200 633 mg/L 137 75 - 125 Chloride 45 100 171 F mg/L 126 75 - 125

Lab Sample ID: 360-39262-2 MSD

Analysis Batch: 88087												
١		Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
	Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
l	Sulfate	360		200	518		mg/L		80	75 - 125	20	20
l	Chloride	45		100	139	F	mg/L		94	75 - 125	(21)	20
L												

ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).											
	pH* $\square = 3\%$ Specific Conductivity * $\square = 5\%$ TSS** $\square = 6\%$			$TDS^{**} \square = 6\%$	v⁄o						
8.0	Sampling Accuracy										
	najority of ground water samples are collected directly from a tap, process stream, or edicated tubing. Rinse blanks will not be collected.										
	8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.			N/A []							
	8.2 Do any rinsate blanks have positive results?	Yes []	No []	N/A	Comments:						
ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below. If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL. If the sample concentration is > 5 × blank value, no qualification is needed.											
NOTE	NOTE: MADEP does not require the collection of rinsate blanks.										
9.0	Field Duplicates										
	9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.	Yes 🗾	No []	N/A []	Comments:						
Q.F	9.2 Were field duplicates collected per the required frequency? APP/IRSWP MADEP Option 1(1 per 20) MADEP Option 3 (1 per 10) MADEP Option 3 (1 per 10)	Yes 🗸	No []	N/A []	Comments:						
	9.3 Was the RPD \leq 30% for waters \leq 50% for soils? Calculate the RPD for results and attach to this review.	Yes	No 📋	N/A []	Comments:						

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OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

ACTION:. Qualify data (J) for both sample results if the RPD exceeded.

Was any of the data qualified?

Yes No No N/A Comments

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

chloride & Sulfate Results
in 2025 our Qualified
estimated (T) from us/aso out 1

REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July 25, 2007.

MADEP, 2010. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Compendium of Quality Control Requirements and Performance Standards for Selected Analytical Protocols," WSC-CAM #10-320, Final, Revision No. 1, 5 July 2010.

MADEP, 2010. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data in Support of Action Conducted Under the Massachusetts Contingency Plan (MCP)," WSC-CAM, Section VIIA, Final, Revision No. 1, 1 July 2010.

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

Client Sample ID: OC-GW-202S

Date Collected: 02/22/12 08:30

Date Received: 02/23/12 16:45

TestAmerica Job ID: 360-39262-1

Lab Sample ID: 360-39262-2

Matrix: Water

Method: 6010C - Metals (ICP) - Disso	lved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND	-	100	13	ug/L			03/06/12 16:19	1
Chromium	3.3	J	5.0	0.66	ug/L			03/06/12 16:19	1

General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	360	7	20	20	mg/L			03/02/12 12:15	10
Chloride	47	J	1.0	1.0	mg/L	*		03/02/12 11:58	1
Ammonia	73		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:59	10
Specific Conductance	1100		1.0	1.0	umhos/cm			03/01/12 09:42	• 1















Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Lab Sample ID: 360-39262-3

Matrix: Water

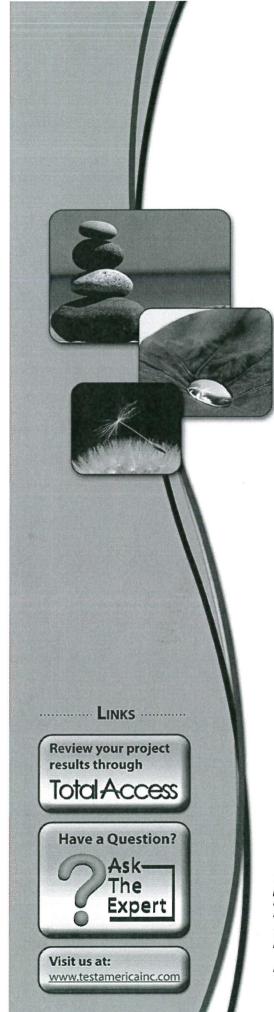
Client Sample ID:	OC-GW-202SDUP
-------------------	---------------

Date Collected: 02/22/12 08:30 Date Received: 02/23/12 16:45

Method: 6010C - Metals (ICP) - Diss	olved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:30	1
Chromium	3.4	J	5.0	0.66	ug/L			03/06/12 16:30	1

General Chemistry						
Analyte	Result Qualifier	RL	RL Unit	D Prepared	Analyzed	Dil Fac
Sulfate	350	20	20 mg/L		02/28/12 03:19	10
Chloride	46 🎵	1.0	1.0 mg/L		02/28/12 03:02	1
Ammonia	66	1.0	1.0 mg/L	02/27/12 10:48	02/27/12 16:04	10
Specific Conductance	1100	1.0	1.0 umhos/cm		03/01/12 09:48	1





FILE COPY

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<u>TestAmerica</u>

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc. TestAmerica Westfield Westfield Executive Park 53 Southampton Road Westfield, MA 01085

Tel: (413)572-4000

TestAmerica Job ID: 360-39255-1

Client Project/Site: Olin Chemical Surface water Quarterly

For:

Olin Corporation
PO BOX 248
Charleston, Tennessee 37

Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by: 3/8/2012 9:58:08 AM

Joe Chimi

Report Production Representative joe.chimi@testamericainc.com

Designee for

Becky Mason Project Manager II

becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Job ID: 360-39255-1

Laboratory: TestAmerica Westfield

Narrative

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 02/23/2012; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 6.0 C.

METALS (ICP)

Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW (360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 02/24/2012 and analyzed on 02/27/2012 and 03/06/2012.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the metals analyses.

All quality control parameters were within the acceptance limits.

DISSOLVED METALS (ICP)

Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW (360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for dissolved metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were analyzed on 03/06/2012.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the metals (ICP) analyses.

All quality control parameters were within the acceptance limits.

ANIONS (28 DAY HOLD TIME)

Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW (360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for anions (28 day hold time) in accordance with EPA Method 300.0. The samples were analyzed on 02/24/2012.

Samples OC-ISCO3-SW (360-39255-1)[10X], OC-ISCO2-SW (360-39255-2)[10X], OC-SW-PZ16RR-SW (360-39255-3)[10X], OC-SW-PZ-17RR-SW (360-39255-4)[10X], OC-SD-17-SW (360-39255-5)[10X], OC-PZ18R-SW (360-39255-6)[10X] and OC-ISCO1-SW (360-39255-7)[10X] required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

ANIONS (48 HR HOLD TIME)

Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW

Case Narrative

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Job ID: 360-39255-1 (Continued)

Laboratory: TestAmerica Westfield (Continued)

(360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for anions (48 hr hold time) in accordance with EPA Method 300.0. The samples were analyzed on 02/24/2012.

Samples OC-ISCO3-SW (360-39255-1)[10X], OC-ISCO2-SW (360-39255-2)[10X], OC-SW-PZ16RR-SW (360-39255-3)[10X], OC-SW-PZ-17RR-SW (360-39255-4)[10X], OC-SD-17-SW (360-39255-5)[10X], OC-PZ18R-SW (360-39255-6)[10X] and OC-ISCO1-SW (360-39255-7)[10X] required dilution prior to analysis due to high non-target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

AMMONIA

Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW (360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for ammonia in accordance with Lachat 107-06-1B. The samples were prepared and analyzed on 02/27/2012.

Samples OC-ISCO2-SW (360-39255-2)[10X], OC-SW-PZ16RR-SW (360-39255-3)[10X], OC-SW-PZ-17RR-SW (360-39255-4)[10X], OC-SD-17-SW (360-39255-5)[10X], OC-PZ18R-SW (360-39255-6)[10X] and OC-ISCO1-SW (360-39255-7)[10X] required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the ammonia analyses.

All quality control parameters were within the acceptance limits.

SPECIFIC CONDUCTIVITY

Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW (360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for specific conductivity in accordance with SM20 2510B. The samples were analyzed on 03/01/2012.

No difficulties were encountered during the conductivity analyses.

All quality control parameters were within the acceptance limits.

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		Mass	DEP Analytica	Protocol Certif	ication Form								
Laborat	ory Name:	TestAmeric	a Westfield	Project #:	360-392	55-1							
Project	Location:	Wilming	jton, MA	RTN:									
This for	his form provides certifications for the following data set: list Laboratory Sample ID Number(s):												
360-392	255-(1-7) S: X												
Matrices	U Other:												
CAM P	rotocols (check all that ap	ply below):										
8260 VC	OC	7470/7471 Hg	Mass DEP VPH	8081 Pesticides	7196 Hex Cr	Mass DEP APH							
CAM II A		CAM III B	CAM IV A	CAM V B	CAM VI B	CAM IX A							
8270 SV CAM II E		7010 Metals CAM III C	Mass DEP EPH CAM IV B	8151 Herbicides CAM V C	8330 Explosives CAM VIII A	TO-15 VOC CAM IX B							
CAWIII	<u> </u>	CAW III C	CAWIV B	9014 Total	CAIVI VIII A	CAWIXB							
6010 Me	etals	6020 Metals	8082 PCB	Cyanide/PAC	6860 Perchlorate								
CAM III	A X	CAM III D	CAM V A	CAM VI A	CAM VIII B								
A	ffirmative	Responses to Que	stions A through I	are required for "	Presumptive Certainty" s	tatus							
	ere all san	nples received in a c	condition consistent	with those describe	d on the Chain-of-Custody,								
A pr													
Ė	ethod holdi			<u> </u>	· · · · · · · · · · · · · · · · · · ·	X Yes No							
D	rotocol(s) fo		nd all associated Q	C requirements spec	cified in the selected CAM	XYes No							
				esponse actions spe ce standard non-con	ecified in the selected CAM formances?	X Yes No							
D "C				• .	ecified in CAM VII A, nd Reporting of Analytical	X Yes No							
			-	thod conducted with	_	Yes No							
		, , ,	, ,	or a list of significant	· ·								
			<u>'</u>	analyte list reported		Yes No							
	valuated in	a laboratory narrativ	ve (including all "No	responses to Ques	<u> </u>	X Yes L No							
				•	sumptive Certainty" statu	IS							
pr	rotocol(s)?		•	ng limits specified ir		X Yes No1							
				" status may not ned 1056 (2)(k) and WCS	essarily meet the data usab	ility and							
		-		e CAM protocol(s) a		X Yes No ¹							
.		<u> </u>	<u> </u>			Yes X No ¹							
		•	<u> </u>	d laboratory narrative	ted CAM protocol(s) ?	162 140							
l, the und	dersigned, a	attest under the pain	s and penalties of p	erjury that, based up	oon my personal inquiry of t he best of my knowledge an								
Signatur	re:	State	intura	Position:	Laboratory	Director							
Printed I	Name:	Steven C.	Hartmann	Date:	3/8/12 9):52							

This form has been electronically signed and approved

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-ISCO3-SW

Lab Sample ID: 360-39255-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	39	J	100	13	ug/L	1	_	6010C	Total/NA
Chromium	0.68	J	5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	77000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	36	J	100	13	ug/L	1		6010C	Dissolved
Sodium	88000		2000	780	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.94		0.050	0.050	mg/L	1	_	300.0	Total/NA
Sulfate	36		2.0	2.0	mg/L	1		300.0	Total/NA
Chloride	140		10	10	mg/L	10		300.0	Total/NA
Ammonia	2.4		0.10	0.10	mg/L	1		L107-06-1B	Total/NA
Specific Conductance	670		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-ISCO2-SW

Lab Sample ID: 360-39255-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	140		100	13	ug/L	1	_	6010C	Total/NA
Chromium	73		5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	140000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	150		100	13	ug/L	1		6010C	Dissolved
Chromium	74		5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	150000		2000	780	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	1.2		0.050	0.050	mg/L	1	_	300.0	Total/NA
Sulfate	420		20	20	mg/L	10		300.0	Total/NA
Chloride	130		10	10	mg/L	10		300.0	Total/NA
Ammonia	92		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1500		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-SW-PZ16RR-SW

Lab Sample ID: 360-39255-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	640		100	13	ug/L	1	_	6010C	Total/NA
Chromium	340		5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	150000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	760		100	13	ug/L	1		6010C	Dissolved
Chromium	360		5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	170000		2000	780	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	1.1		0.050	0.050	mg/L	1	_	300.0	Total/NA
Sulfate	470		20	20	mg/L	10		300.0	Total/NA
Chloride	160		10	10	mg/L	10		300.0	Total/NA
Ammonia	100		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1600		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-SW-PZ-17RR-SW

Lab Sample ID: 360-39255-4

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	1000	100	13	ug/L		_	6010C	Total/NA
Chromium	510	5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	190000	2000	780	ug/L	1		6010C	Total/NA
Aluminum	1200	100	13	ug/L	1		6010C	Dissolved
Chromium	540	5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	220000	2000	780	ug/L	1		6010C	Dissolved

TestAmerica Westfield 3/8/2012

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Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-SW-PZ-17RR-SW (Continued)

l ah	Sample	ID:	360.	-39255-4	

Lab Sample ID: 360-39255-6

Lab Sample ID: 360-39255-7

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	3.4		0.050	0.050	mg/L			300.0	Total/NA
Sulfate	550		20	20	mg/L	10		300.0	Total/NA
Chloride	220		10	10	mg/L	10		300.0	Total/NA
Ammonia	89		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	2000		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-SD-17-SW Lab Sample ID: 360-39255-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	780		100	13	ug/L	1	_	6010C	Total/NA
Chromium	370		5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	180000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	890		100	13	ug/L	1		6010C	Dissolved
Chromium	410		5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	210000		2000	780	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	3.7		0.050	0.050	mg/L	1	_	300.0	Total/NA
Sulfate	460		20	20	mg/L	10		300.0	Total/NA
Chloride	210		10	10	mg/L	10		300.0	Total/NA
Ammonia	77		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1800		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ18R-SW

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	82	J	100	13	ug/L	1	_	6010C	Total/NA
Chromium	14		5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	98000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	92	J	100	13	ug/L	1		6010C	Dissolved
Chromium	14		5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	120000		2000	780	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.34		0.050	0.050	mg/L	1	_	300.0	Total/NA
Sulfate	180		20	20	mg/L	10		300.0	Total/NA
Chloride	140		10	10	mg/L	10		300.0	Total/NA
Ammonia	51		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1000		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-ISCO1-SW

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	85	J	100	13	ug/L	1		6010C	Total/NA
Chromium	15		5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	100000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	100		100	13	ug/L	1		6010C	Dissolved
Chromium	15		5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	120000		2000	780	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.27		0.050	0.050	mg/L	1	_	300.0	Total/NA
Sulfate	170		20	20	mg/L	10		300.0	Total/NA
Chloride	140		10	10	mg/L	10		300.0	Total/NA
Ammonia	44		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	970		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

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TestAmerica Westfield 3/8/2012

Method Summary

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL WFD
300.0	Chloride & Sulfate	40CFR136A	TAL WFD
300.0	Nitrate & Nitrite	40CFR136A	TAL WFD
L107-06-1B	Nitrogen Ammonia	LACHAT	TAL WFD
SM 2510B	Conductivity, Specific Conductance	SM	TAL WFD

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

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Sample Summary

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
360-39255-1	OC-ISCO3-SW	Water	02/23/12 07:20	02/23/12 16:45
360-39255-2	OC-ISCO2-SW	Water	02/23/12 07:40	02/23/12 16:45
360-39255-3	OC-SW-PZ16RR-SW	Water	02/23/12 08:00	02/23/12 16:45
360-39255-4	OC-SW-PZ-17RR-SW	Water	02/23/12 08:20	02/23/12 16:45
360-39255-5	OC-SD-17-SW	Water	02/23/12 08:45	02/23/12 16:45
360-39255-6	OC-PZ18R-SW	Water	02/23/12 08:55	02/23/12 16:45
360-39255-7	OC-ISCO1-SW	Water	02/23/12 09:05	02/23/12 16:45

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Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-ISCO3-SW

Lab Sample ID: 360-39255-1 Date Collected: 02/23/12 07:20 Date Received: 02/23/12 16:45

Matrix: Water

Method: 6010C - Metals (ICP)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	39	J	100	13	ug/L		02/24/12 09:45	02/27/12 12:54	1
Chromium	0.68	J	5.0	0.66	ug/L		02/24/12 09:45	02/27/12 12:54	1
Sodium	77000		2000	780	ug/L		02/24/12 09:45	03/06/12 15:47	1
– Method: 6010C - Metals (ICP) - D	issolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	36	J	100	13	ug/L			03/06/12 16:39	1
Chromium	ND		5.0	0.66	ug/L			03/06/12 16:39	1
Sodium	88000		2000	780	ug/L			03/06/12 16:39	1
- General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.94		0.050	0.050	mg/L			02/24/12 16:53	1
Sulfate	36		2.0	2.0	mg/L			02/24/12 16:53	1
Chloride	140		10	10	mg/L			02/24/12 17:10	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 17:10	10
Ammonia	2.4		0.10	0.10	mg/L		02/27/12 10:48	02/27/12 15:34	1
Specific Conductance	670		1.0	1.0	umhos/cm			03/01/12 09:29	1

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

Client Sample ID: OC-ISCO2-SW

Date Collected: 02/23/12 07:40

Date Received: 02/23/12 16:45

TestAmerica Job ID: 360-39255-1

Lab Sample ID: 360-39255-2

Matrix: Water

Method: 6010C - Metals (ICP) Analyte		Qualifier	RL	MDI	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	140		100		ug/L		02/24/12 09:45	02/27/12 12:57	1
					-				1
Chromium	73		5.0		•		02/24/12 09:45	02/27/12 12:57	1
Sodium	140000		2000	780	ug/L		02/24/12 09:45	03/06/12 15:51	1
Method: 6010C - Metals (ICP)	- Dissolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	150		100	13	ug/L			03/06/12 16:42	1
Chromium	74		5.0	0.66	ug/L			03/06/12 16:42	1
Sodium	150000		2000	780	ug/L			03/06/12 16:42	1
- General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	1.2		0.050	0.050	mg/L			02/24/12 17:27	1
Sulfate	420		20	20	mg/L			02/24/12 17:45	10
Chloride	130		10	10	mg/L			02/24/12 17:45	10
Nitrite as N	ND		0.10		mg/L			02/24/12 17:45	10
Ammonia	92		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:52	10
Specific Conductance	1500		1.0	1.0	umhos/cm			03/01/12 09:30	1

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Lab Sample ID: 360-39255-3

Client Sample ID: OC-SW-PZ16RR-SW Date Collected: 02/23/12 08:00 Matrix: Water

Date Received: 02/23/12 16:45

Method: 6010C - Metals (ICP)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	640		100	13	ug/L		02/24/12 09:45	02/27/12 13:00	1
Chromium	340		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:00	1
Sodium	150000		2000	780	ug/L		02/24/12 09:45	03/06/12 15:54	1
Method: 6010C - Metals (ICP)	- Dissolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	760		100	13	ug/L			03/06/12 16:51	1
Chromium	360		5.0	0.66	ug/L			03/06/12 16:51	1
Sodium	170000		2000	780	ug/L			03/06/12 16:51	1
General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	1.1		0.050	0.050	mg/L			02/24/12 18:02	1
Sulfate	470		20	20	mg/L			02/24/12 18:53	10
Chloride	160		10	10	mg/L			02/24/12 18:53	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 18:53	10
Ammonia	100		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:53	10
Specific Conductance	1600		1.0	1.0	umhos/cm			03/01/12 09:32	1

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

Client Sample ID: OC-SW-PZ-17RR-SW

Lab Sample ID: 360-39255-4

TestAmerica Job ID: 360-39255-1

Matrix: Water

Date Collected: 02/23/12 08:20

Date Received: 02/23/12 16:45

Method: 6010C - Metals (ICP)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1000		100	13	ug/L		02/24/12 09:45	02/27/12 13:09	1
Chromium	510		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:09	1
Sodium	190000		2000	780	ug/L		02/24/12 09:45	03/06/12 15:57	1
<u> </u>									

Method: 6010C - Metals (IC	P) - Dissolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1200		100	13	ug/L			03/06/12 16:54	1
Chromium	540		5.0	0.66	ug/L			03/06/12 16:54	1
Sodium	220000		2000	780	ug/L			03/06/12 16:54	1

General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	3.4		0.050	0.050	mg/L			02/24/12 19:10	1
Sulfate	550		20	20	mg/L			02/24/12 19:27	10
Chloride	220		10	10	mg/L			02/24/12 19:27	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 19:27	10
Ammonia	89		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:54	10
Specific Conductance	2000		1.0	1.0	umhos/cm			03/01/12 09:33	1

Client: Olin Corporation

Client Sample ID: OC-SD-17-SW

Date Collected: 02/23/12 08:45

Date Received: 02/23/12 16:45

Project/Site: Olin Chemical Surface water Quarterly

Lab Sample ID: 360-39255-5

TestAmerica Job ID: 360-39255-1

Matrix: Water

Method: 6010C - Metals (ICP) Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	780		100		ug/L	<u>-</u>	02/24/12 09:45	02/27/12 13:12	1
Chromium	370		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:12	1
Sodium	180000		2000	780	ug/L		02/24/12 09:45	03/06/12 16:00	1
Method: 6010C - Metals (ICP) - Diss		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

Method: 6010C - Metals (ICP) - Dissolved										
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac		
Aluminum	890	100	13	ug/L			03/06/12 16:57	1		
Chromium	410	5.0	0.66	ug/L			03/06/12 16:57	1		
Sodium	210000	2000	780	ug/L			03/06/12 16:57	1		

General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	3.7		0.050	0.050	mg/L			02/24/12 19:44	1
Sulfate	460		20	20	mg/L			02/24/12 20:01	10
Chloride	210		10	10	mg/L			02/24/12 20:01	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 20:01	10
Ammonia	77		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:55	10
Specific Conductance	1800		1.0	1.0	umhos/cm			03/01/12 09:35	1

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-PZ18R-SW

Date Collected: 02/23/12 08:55 Date Received: 02/23/12 16:45 Lab Sample ID: 360-39255-6

=	
	Matrix: Water

Method: 6010C - Metals (ICP)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Aluminum	82	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:15	
Chromium	14		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:15	
Sodium	98000		2000	780	ug/L		02/24/12 09:45	03/06/12 16:03	

Method: 6010C - Metals (ICF	P) - Dissolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	92	J	100	13	ug/L			03/06/12 17:00	1
Chromium	14		5.0	0.66	ug/L			03/06/12 17:00	1
Sodium	120000		2000	780	ug/L			03/06/12 17:00	1

General Chemistry	D lk	0	D.	D.	11	_	Duranad	Amakanad	D!! F
Analyte	Result	Qualifier	RL	KL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.34		0.050	0.050	mg/L			02/24/12 20:19	1
Sulfate	180		20	20	mg/L			02/24/12 20:36	10
Chloride	140		10	10	mg/L			02/24/12 20:36	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 20:36	10
Ammonia	51		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:56	10
Specific Conductance	1000		1.0	1.0	umhos/cm			03/01/12 09:36	1

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

Lab Sample ID: 360-39255-7

TestAmerica Job ID: 360-39255-1

Date Collected: 02/23/12 09:05 Matrix: Water

Date Received: 02/23/12 16:45

Client Sample ID: OC-ISCO1-SW

Method: 6010C - Metals (ICP)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	85	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:18	1
Chromium	15		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:18	1
Sodium	100000		2000	780	ug/L		02/24/12 09:45	03/06/12 16:06	1
– Method: 6010C - Metals (ICP) -	- Dissolved								
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	100		100	13	ug/L			03/06/12 17:03	1
Chromium	15		5.0	0.66	ug/L			03/06/12 17:03	1
Sodium	120000		2000	780	ug/L			03/06/12 17:03	1
General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.27		0.050	0.050	mg/L			02/24/12 20:53	1
Sulfate	170		20	20	mg/L			02/24/12 21:10	10
Chloride	140		10	10	mg/L			02/24/12 21:10	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 21:10	10
Ammonia	44		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:57	10
Specific Conductance	970		1.0	1.0	umhos/cm			03/01/12 09:45	1

Definitions/Glossary

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

Toxicity Equivalent Quotient (Dioxin)

TestAmerica Job ID: 360-39255-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

TEQ

Abbreviation	These commonly used abbreviations may or may not be present in this report.
\(\tilde{\psi} \)	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)

TestAmerica Westfield 3/8/2012

TestAmerica Job ID: 360-39255-1

Project/Site: Olin Chemical Surface water Quarterly

Metals

Prep Batch: 87766

Client: Olin Corporation

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	3010A	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	3010A	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	3010A	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	3010A	
360-39255-5	OC-SD-17-SW	Total/NA	Water	3010A	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	3010A	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	3010A	
LCS 360-87766/2-A	Lab Control Sample	Total/NA	Water	3010A	
LCSD 360-87766/3-A	Lab Control Sample Dup	Total/NA	Water	3010A	
MB 360-87766/1-A	Method Blank	Total/NA	Water	3010A	

Analysis Batch: 87865

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	6010C	87766
360-39255-2	OC-ISCO2-SW	Total/NA	Water	6010C	87766
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	6010C	87766
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	6010C	87766
360-39255-5	OC-SD-17-SW	Total/NA	Water	6010C	87766
360-39255-6	OC-PZ18R-SW	Total/NA	Water	6010C	87766
360-39255-7	OC-ISCO1-SW	Total/NA	Water	6010C	87766
LCS 360-87766/2-A	Lab Control Sample	Total/NA	Water	6010C	87766
LCSD 360-87766/3-A	Lab Control Sample Dup	Total/NA	Water	6010C	87766
MB 360-87766/1-A	Method Blank	Total/NA	Water	6010C	87766

Analysis Batch: 88128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	6010C	87766
360-39255-2	OC-ISCO2-SW	Total/NA	Water	6010C	87766
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	6010C	87766
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	6010C	87766
360-39255-5	OC-SD-17-SW	Total/NA	Water	6010C	87766
360-39255-6	OC-PZ18R-SW	Total/NA	Water	6010C	87766
360-39255-7	OC-ISCO1-SW	Total/NA	Water	6010C	87766

Analysis Batch: 88130

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Dissolved	Water	6010C	
360-39255-2	OC-ISCO2-SW	Dissolved	Water	6010C	
360-39255-3	OC-SW-PZ16RR-SW	Dissolved	Water	6010C	
360-39255-4	OC-SW-PZ-17RR-SW	Dissolved	Water	6010C	
360-39255-5	OC-SD-17-SW	Dissolved	Water	6010C	
360-39255-6	OC-PZ18R-SW	Dissolved	Water	6010C	
360-39255-7	OC-ISCO1-SW	Dissolved	Water	6010C	
LCS 360-88130/1	Lab Control Sample	Total/NA	Water	6010C	
LCSD 360-88130/13	Lab Control Sample Dup	Total/NA	Water	6010C	
MB 360-88130/2	Method Blank	Total/NA	Water	6010C	

General Chemistry

Analysis Batch: 87810

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	300.0	

QC Association Summary

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

General Chemistry (Continued)

Analysis Batch: 87810 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	300.0	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	300.0	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	300.0	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	300.0	
360-39255-5	OC-SD-17-SW	Total/NA	Water	300.0	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	300.0	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	300.0	
LCS 360-87810/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-87810/3	Method Blank	Total/NA	Water	300.0	

Prep Batch: 87823

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	Distill/Ammonia	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	Distill/Ammonia	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	Distill/Ammonia	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	Distill/Ammonia	
360-39255-5	OC-SD-17-SW	Total/NA	Water	Distill/Ammonia	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	Distill/Ammonia	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	Distill/Ammonia	
LCS 360-87823/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 360-87823/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 87850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	L107-06-1B	87823
360-39255-2	OC-ISCO2-SW	Total/NA	Water	L107-06-1B	87823
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	L107-06-1B	87823
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	L107-06-1B	87823
360-39255-5	OC-SD-17-SW	Total/NA	Water	L107-06-1B	87823
360-39255-6	OC-PZ18R-SW	Total/NA	Water	L107-06-1B	87823
360-39255-7	OC-ISCO1-SW	Total/NA	Water	L107-06-1B	87823
LCS 360-87823/2-A	Lab Control Sample	Total/NA	Water	L107-06-1B	87823
MB 360-87823/1-A	Method Blank	Total/NA	Water	L107-06-1B	87823

Analysis Batch: 87884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	300.0	
360-39255-1	OC-ISCO3-SW	Total/NA	Water	300.0	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	300.0	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	300.0	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	300.0	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	300.0	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	300.0	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	300.0	
360-39255-5	OC-SD-17-SW	Total/NA	Water	300.0	
360-39255-5	OC-SD-17-SW	Total/NA	Water	300.0	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	300.0	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	300.0	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	300.0	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	300.0	
LCS 360-87884/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-87884/3	Method Blank	Total/NA	Water	300.0	

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TestAmerica Westfield 3/8/2012

QC Association Summary

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

General Chemistry (Continued)

Analysis Batch: 87959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	SM 2510B	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	SM 2510B	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	SM 2510B	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	SM 2510B	
360-39255-5	OC-SD-17-SW	Total/NA	Water	SM 2510B	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	SM 2510B	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	SM 2510B	
LCS 360-87959/1	Lab Control Sample	Total/NA	Water	SM 2510B	
MB 360-87959/3	Method Blank	Total/NA	Water	SM 2510B	

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Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 360-87766/1-A

Lab Sample ID: LCS 360-87766/2-A

Matrix: Water

Analysis Batch: 87865

Client Sample ID: Method Blank
Prep Type: Total/NA

Prep Batch: 87766

	MB	MR							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L		02/24/12 09:45	02/27/12 12:02	1
Chromium	ND		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 12:02	1
Sodium	ND		2000	780	ug/L		02/24/12 09:45	02/27/12 12:02	1

Client Sample ID: Lab Control Sample

Matrix: Water

Analysis Batch: 87865

	Prep Type: Total/NA
	Prep Batch: 87766
_	

	Spike	LCS	LCS			%Rec.	
Analyte	Added	Result	Qualifier Unit	. D	%Rec	Limits	
Aluminum	5000	5010	ug/L		100	80 - 120	
Chromium	1000	1020	ug/L		102	80 - 120	
Sodium	20000	20700	ug/L	<u>-</u>	103	80 - 120	

Lab Sample ID: LCSD 360-87766/3-A Client Sample ID: Lab Control Sample Dup **Matrix: Water Prep Type: Total/NA** Prep Batch: 87766

Analysis Batch: 87865

LCSD LCSD Spike %Rec. RPD Limits Analyte Added Result Qualifier Unit D %Rec RPD Limit Aluminum 5000 5260 ug/L 105 80 - 120 5 20 Chromium 1000 1050 ug/L 80 - 120 105 3 20 20000 Sodium 20600 ug/L 103 80 - 120

Lab Sample ID: MB 360-88130/2 Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88130

	IVID	IVID								
Analyte	Result	Qualifier	RL	MDL	Unit	D)	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L				03/06/12 16:13	1
Chromium	ND		5.0	0.66	ug/L				03/06/12 16:13	1
Sodium	ND		2000	780	ua/l				03/06/12 16:13	1

Lab Sample ID: LCS 360-88130/1 Client Sample ID: Lab Control Sample **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88130

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Aluminum	5000	5270		ug/L	_	105	80 - 120	
Chromium	1000	1040		ug/L		104	80 - 120	
Sodium	20000	10800		ua/l		gg	80 120	

Lab Sample ID: LCSD 360-88130/13 Client Sample ID: Lab Control Sample Dup **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88130

_	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Aluminum	5000	5230		ug/L		105	80 - 120	1	20
Chromium	1000	1030		ug/L		103	80 - 120	0	20
Sodium	20000	19900		ug/L		99	80 - 120	0	20

TestAmerica Job ID: 360-39255-1

Client Sample ID: Method Blank

Prep Type: Total/NA

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

Method: 300.0 - Nitrate & Nitrite

Lab Sample ID: MB 360-87884/3

Matrix: Water

Analysis Batch: 87884

Client Sample ID: Method Blank Prep Type: Total/NA

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Result Qualifier RL RL Unit D Dil Fac Analyte Prepared Analyzed 0.050 mg/L Nitrate as N ND 0.050 02/24/12 14:53 Nitrite as N ND 0.010 02/24/12 14:53 0.010 mg/L

Lab Sample ID: LCS 360-87884/4 Client Sample ID: Lab Control Sample Prep Type: Total/NA

Matrix: Water

Analysis Batch: 87884

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	Spike	LCS	LCS			%Rec.	
Analyte	Added	Result	Qualifier U	Init D	%Rec	Limits	
Nitrate as N	4.00	3.99	m	ng/L	100	85 - 115	
Nitrite as N	4.00	4.06	m	ng/L	102	85 - 115	

Method: 300.0 - Chloride & Sulfate

Lab Sample ID: MB 360-87810/3

Matrix: Water

Analysis Batch: 87810

	MB	MB							
Analyte	Result	Qualifier	RL	RL	Unit)	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			02/24/12 14:52	1
Chloride	ND		1.0	1.0	mg/L			02/24/12 14:52	1

Lab Sample ID: LCS 360-87810/4 Client Sample ID: Lab Control Sample Prep Type: Total/NA

Matrix: Water

Analysis Batch: 87810

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	Spike	LCS	LCS				%Rec.		
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Sulfate	 80.0	80.2		mg/L		100	85 - 115		-
Chloride	40.0	40.6		mg/L		101	85 - 115		

Method: L107-06-1B - Nitrogen Ammonia

Lab Sample ID: MB 360-87823/1-A

Analysis Batch: 87850

Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA Prep Batch: 87823 MB MB

Analyte	Result Qualifier	RL	RL Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND —	0.10	0.10 mg/L		02/27/12 10:48	02/27/12 15:28	1

Lab Sample ID: LCS 360-87823/2-A

Matrix: Water

Analysis Batch: 87850							Prep	Batch:	87823
	Spike	LCS	LCS				%Rec.		
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Ammonia	10.0	10.9		mg/L		109	90 - 110		

TestAmerica Westfield 3/8/2012

Prep Type: Total/NA

Client Sample ID: Lab Control Sample

QC Sample Results

Client: Olin Corporation TestAmerica Job ID: 360-39255-1

RL

1.0

Project/Site: Olin Chemical Surface water Quarterly

Method: SM 2510B - Conductivity, Specific Conductance

ΜВ Result Qualifier

ND

Lab Sample ID: MB 360-87959/3 **Matrix: Water**

Analysis Batch: 87959

Specific Conductance

Analyte

	Prep Type: Total/NA
МВ	

D

Prepared

RL Unit

1.0 umhos/cm

Lab Sample ID: LCS 360-87959/1

Matrix: Water

Analysis Batch: 87959

Spike LCS LCS %Rec. Analyte Added Result Qualifier Limits Unit %Rec Specific Conductance 1410 1400 umhos/cm 99 85 - 115

Client Sample ID: Method Blank

Analyzed

03/01/12 09:22

Prep Type: Total/NA

Client Sample ID: Lab Control Sample

Dil Fac

DILUTION LOGS

TestAmerica Westfield Analytical Dilution Preparation Log

Date: 224112

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									<u> </u>	Serial	Dilution		
Analyst Initials	Date	Method	LIMs Sample ID	Rpťd Díl.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
AM8	2/24/12	300.0	3925A1	10x	1	ML	10	ML		,			
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entries completed by day [new page each day]

Date: 224112

 													
										Serial	Dilution		
Analyst Initials	Date	Method	LIMs Sample ID	Rpťd Díl.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
AM8	2/24/12	300.0	3925A1	10x	1	ML	10	ML					
			2				,						
	77.11.41.41.41.41.41.41.41.41.41.41.41.41.		3										
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entries completed by day [new page each day]















TestAmerica Westfield

Analytical Dilution Preparation Log

Date:	2-27-12	

Date (**)	Method	LIMs Sample ID										
27-15	(Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
	NH3	39255CZA	lox	(mL	lo	mL	1.45 %			A. Asia	
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\		V CZA	7	7	7	7	7					
		39262 CIAS	5030X	1500 Alk	Mh	10	mL	1 Com 1 2				<u> </u>
		CZA	10%	7	me	10	nul					
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			C5A2 C6A2 C7A2 29 262 C1A2 C1A C1A MS C1 C MSD	C5A2 C6A2 C7A2 39262 C1A2 5080 C1A 10X C1C MSU C2A	C5A2 C6A2 C7A2 B9262 C1A2 S030× A160 C7A (0X () C1B MS () C1C NSW () C3A	C5A2 C6A2 C7A2 39262 C1A2 5282 ALC ML C2A 10X 1 ML C2D MS 1 1	C5A2 C6A2 C7A2 B9262 C1A2 S222 ALC UL 10 C2A (0X (UL 10 C1B MS ()	C5A2 C6A2 C7A2 39262 C1A2 528× ALC UL 10 ML C2A 10X 1 ML 10 ML C2D MS 1 ML 10 ML C2CMSD 1 ML 10 ML	CSAN COAR OX I WL 10 WL CLB MS (CLC MS)	C5A-1 C6A-3 C7A-3 B9 262 C1A-3 5030× ALC UL 10 ML C2A 10× 1 ML 10 ML C2B MS 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	C5A2 C6A2 C7A2 39262 C1A2 S282X ALC UL 10 ML C2A 10X 1 ML 10 ML C1D MS 1 1 (C2CMS) 1 (C2A)	C5A2 C2A3 39262 C1A2 S282X ALC UL 10 ML C2A 10X 1 ML 10 ML C2B MS 1 1 (C2C MSD) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

entries completed by day [new page each day]

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-ISCO3-SW

Date Collected: 02/23/12 07:20 Date Received: 02/23/12 16:45 Lab Sample ID: 360-39255-1

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 12:54	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 15:47	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 16:39	TJS	TAL WFD
Total/NA	Analysis	300.0		1	87810	02/24/12 16:53	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 17:10	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		1	87850	02/27/12 15:34	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 16:53	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 17:10	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:29	AMS	TAL WFD

Client Sample ID: OC-ISCO2-SW

Date Collected: 02/23/12 07:40

Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-2

Lab Sample ID: 360-39255-3

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 12:57	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 15:51	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 16:42	TJS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 17:45	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:52	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 17:27	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 17:45	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:30	AMS	TAL WFD

Client Sample ID: OC-SW-PZ16RR-SW

Date Collected: 02/23/12 08:00

Date Collected	: 02/23/12 08:0	00						Matrix: Water
Date Received	: 02/23/12 16:4	15						
_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 13:00	TJS	TAL WFD

Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 13:00	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 15:54	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 16:51	TJS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 18:53	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:53	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 18:02	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 18:53	AMS	TAL WFD

Lab Chronicle

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-SW-PZ16RR-SW

Date Collected: 02/23/12 08:00 Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-3

Matrix: Water

Batch Batch Dilution Batch Prepared **Prep Type** Type Method Run Factor Number or Analyzed Analyst Lab Total/NA Analysis SM 2510B 87959 03/01/12 09:32 AMS TAL WFD

Client Sample ID: OC-SW-PZ-17RR-SW Lab Sample ID: 360-39255-4

Date Collected: 02/23/12 08:20

Matrix: Water

Date Received: 02/23/12 16:45

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 13:09	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 15:57	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 16:54	TJS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 19:27	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:54	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 19:10	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 19:27	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:33	AMS	TAL WFD

Client Sample ID: OC-SD-17-SW Lab Sample ID: 360-39255-5

Date Collected: 02/23/12 08:45 Matrix: Water

Date Received: 02/23/12 16:45

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 13:12	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 16:00	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 16:57	TJS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 20:01	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:55	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 19:44	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 20:01	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:35	AMS	TAL WFD

Client Sample ID: OC-PZ18R-SW

Lab Sample ID: 360-39255-6 Date Collected: 02/23/12 08:55 Matrix: Water

Date Received: 02/23/12 16:45

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 13:15	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 16:03	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 17:00	TJS	TAL WFD

TestAmerica Westfield 3/8/2012

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Lab Chronicle

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

Lab Cample ID: 200 20055 C

Lab Sample ID: 360-39255-6

Lab Sample ID: 360-39255-7

TestAmerica Job ID: 360-39255-1

Matrix: Water

Client Sample ID: OC-PZ18R-SW Date Collected: 02/23/12 08:55

Date Received: 02/23/12 16:45

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10	87810	02/24/12 20:36	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:56	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 20:19	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 20:36	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:36	AMS	TAL WFD

Client Sample ID: OC-ISCO1-SW

Date Collected: 02/23/12 09:05

3/12 09:05 Matrix: Water

Date Received: 02/23/12 16:45

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 13:18	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 16:06	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 17:03	TJS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 21:10	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:57	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 20:53	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 21:10	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:45	AMS	TAL WFD

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

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Certification Summary

Client: Olin Corporation

Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Westfield	Connecticut	State Program	1	PH-0494
TestAmerica Westfield	Maine	State Program	1	MA00014
TestAmerica Westfield	Massachusetts	State Program	1	M-MA014
TestAmerica Westfield	New Hampshire	NELAC	1	2539
TestAmerica Westfield	New York	NELAC	2	10843
TestAmerica Westfield	Rhode Island	State Program	1	LAO00057
TestAmerica Westfield	Vermont	State Program	1	VT-10843

Accreditation may not be offered or required for all methods and analytes reported in this package . Please contact your project manager for the laboratory's current list of certified methods and analytes.

		State where Primary Accreditation is Carried		
		New		
		Hampshire	Mana	0
Method Name	Description	(NELAC)	Mass	Conn
SM 4500 CI F	Chlorine, Residual		P NP	
SM 9215E SM 9222D	Heterotrophic Plate Count (SimPlate)		NP	
SM 9222D SM 9223	Coliforms, Fecal (Membrane Filter) Coliforms, Total, and E.Coli (Colilert-P/A)		P	
	, , ,		<u>г</u> Р	
SM 9223	Coliforms, Total, and E.Coli (Enumeration)		•	
1103.1 Enterolert	E.coli Enterococcus		ambient/	
200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	source NP/P	
200.6 Rev 5.4 200.7 Rev 4.4	Metals (ICP/MS) (list upon request) Metals (ICP)(list upon request)	NP/P	NP/P	
6010B/C		NP/SW	INF/F	
245.1	Metals (ICP)(list upon request) Mercury (CVAA)	NP/P	NP	
7470A		NP NP	141	
7470A 7471A	Mercury (CVAA)	SW		
SM 2340B	Mercury (CVAA) Total Hardness (as CaCO3) by calculation	NP/P	NP	
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P	INF	
3010A		NP/P		
3010A 3020A	Preparation, Total Metals Preparation, Total Metals	NP/P/SW		-
3020A 3050B	Preparation, Total Metals Preparation, Metals	SW SW		
504.1		P	P	-
608 608	EDB, DBCP and 1,2,3-TCP (GC) Organochlorine Pest/PCBs (list upon request)	NP	NP	
625	0 1 1 /	NP	NP	
3546	Semivolatile Org Comp (GC/MS)(list upon request) Microwave Extraction	SW	INF	
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP NP		
8081A/B		NP/SW		
8081A/B 8082/A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		
8082/A 8270C/D	PCBs by Gas Chromatography(list upon request)	NP/SW		
CT ETPH	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW
MA-EPH	Conn - Ext. Total petroleum Hydrocarbons (GC) Mass - Extractable Petroleum Hydrocarbons (GC)	NP/SW		INF/SW
524.2	· · · · · · · · · · · · · · · · · · ·	P	P	
524.2	Volatile Org Comp (GC/MS)(list upon request) Trihalomethane compounds	P	P	
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	
5035	Closed System Purge and Trap	SW	141	
5030B	Purge and Trap	NP NP		
8260B/C	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)	1417044		
180.1	Turbidity, Nephelometric	Р	Р	
300	Anions, Ion Chromatography	NP/P	NP/P	
410.4	COD	NP	NP	
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP NP	NP	
7196A	Chromium, Hexavalent	NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		
9045C	pH	SW		
L107041C	Nitrogen, Nitrate	NP	Р	
L107-06-1B	Nitrogen Ammonia	NP	NP	
L204001A CN	Cyanide, Total	Р	NP/P	
L210-001A	Phenolics, Total Recoverable	NP	NP	
SM 2320B	Alkalinity	NP/P	NP/P	
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	İ
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	1
SM 3500 CR D	Chromium, Hexavalent	NP		ì
SM 4500 H+ B	pH	NP/P	NP/P	1
SM 4500 NO2 B	Nitrogen, Nitrite	NP	Р	1
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	1
SM 4500 P E	Phosphorus, Total	NP	NP	1
SM 4500 S2 D	Sulfide, Total	NP		İ
	· · · · · · · · · · · · · · · · · · ·	NP	NP	
SM 5210B	BOD, 5-Day	1 141 1	INI	

Not all organic compounds are accreditied under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory The lab carries additional accreditations with several states. This is the laboratories typcial listing but is subject to change based on the laboratories current certification standing.

Login Sample Receipt Checklist

Client: Olin Corporation Job Number: 360-39255-1

Login Number: 39255 List Source: TestAmerica Westfield

List Number: 1

Creator: Ard, Vanessa L

Creator: Ard, vanessa L				
Question	Answer	Comment		
Radioactivity either was not measured or, if measured, is at or below background	N/A			
The cooler's custody seal, if present, is intact.	N/A			
The cooler or samples do not appear to have been compromised or tampered with.	True			
Samples were received on ice.	True			
Cooler Temperature is acceptable.	True			
Cooler Temperature is recorded.	True			
COC is present.	True			
COC is filled out in ink and legible.	True			
COC is filled out with all pertinent information.	True			
Is the Field Sampler's name present on COC?	True			
There are no discrepancies between the sample IDs on the containers and the COC.	True			
Samples are received within Holding Time.	True			
Sample containers have legible labels.	True			
Containers are not broken or leaking.	True			
Sample collection date/times are provided.	True			
Appropriate sample containers are used.	True			
Sample bottles are completely filled.	True			
Sample Preservation Verified.	True			
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True			
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A			
Multiphasic samples are not present.	True			
Samples do not require splitting or compositing.	True			
Residual Chlorine Checked.	N/A			

TestAmerica Westfield

Boston Service Center

Westfield Executive Park 53 Southampton Road Westfield, MA 01085

240 Bear Hill Rd. Suite 104 Waltham, MA 02451

Chain of Custody Record

TestAmerica

Phone (413) 572-4000 Fax (413) 572-3707	Phone (781) 46	6-6900 Fax	(781) 466-69	01												THE LEADER IN ENVIRONMENTAL TESTING
Client Information	Sampler:	chand/	leroy John	Lab !								Carrier	Fracking Not	(s):		^{coc №} 21067
Company:		19859		E-Ma	ait:											Page:
Latin Goris										Analy	sis R	equeste	ď			Job#:
Address: 51 Eames 5+	Due Date Reques	ted:			1					-1		cqueste	<u> </u>		\dashv	Preservation Codes:
Cibe .	TAT Requested (days):			┨					agosoyel						A - HCL J - DI Water B - NaOH M - Hexane
State Zie	4						1	٤	/nn	250		1				C - Zn Acetate N - None
ma 0:887								٤	$\stackrel{\sim}{\supset}$	200	G.			1		D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3
Phone: 978 658 6121	Quote #:					TOTAL DESIGNATION OF THE PERSON	Amm onia	123	9	15					F - MeOH R - Na2S2SO3	
Email:	PO #:							ŝ	10.	30000	164					H - Ascorbic Acid S - H2SO4 1 - Ice Z - other (specify)
Project Name/number:	W0 #:							7,		+ √€	<u>_</u>				818	Regulatory programs: MCP GW1/S1
Site: BY SURFACE WATER						Ple?		ڼې	tas	اع ق	10.				ntal	RCP CT RSR
ailmington mo	35UV#,	SSOW#.					SD2	Lach-102.06	- f. Hear.	200- 48 HRO 03/	Potal				oj co	DEP Form
, , , , , , , , , , , , , , , , , , ,			Sample	Watrix (W=water,	Initials	Field Filtered Sample?	Perform MS/MSD?	۶,	1	% 24%	08	and the same of th				
			Туре	S=solid, O=waste/oil,	pler's	Filte	E	징	90	5 6	9	ATTIVITY OF THE PARTY OF THE PA			Num	
Sample Identification	Sample Date	Sample Time	(C=comp, G=grab)	BT~Tisaue, A~Air)	Sampler's	Field	Perfo	3	60108	S/W	601	[Fotal Number	Special Instructions/Note:
			Preservati	······································	X	M	X	5		n	В			-	+	Opecial histractions/wore.
0C-500-15C03 SW	2-23-12	7:20	6-	W	ĺ	ĬÌ				/	义				3	
0C.500-15CO2 5W		7140]	i				X	X	7	X				3	
OC-BW-PZ/GRRSW		8:00						2	L	X	X			-	3	
OC - SW-PZ-17RRSW	:	8:20						×	X	<u> </u>	メ				3	
0C-50-175W		8:45						x	X	1	又				3	<u> </u>
6C- PZ18RGW		8:55			1			V		X	X				7	
DC - 15COI SW	V	9:05	U	V	ļ			X	χ̈́	Ý.	X			 	3	
						\Box			^					 		
									_						+-	
											 			 	+	
Possible Hazard Identification	<u></u>		<u> </u>			San	nple	Disp	osai	f A fee	may i	e assess	ed if sam	ples are r	etair	ned longer than 1 month)
Non-Hazard Flammable Skin Irritant Po	oison B Un	known 🗔	Radiologica	a/			$^{-1}R\epsilon$	etum	To C	Client	L	[⊥] Disposa	al By Lab			chive For Months
Deliverable Requested: I, II, IV, Other (specify)						<u>, , , , , , , , , , , , , , , , , , , </u>		9		s/QC F	Require	ments:				
Relinquished by Relinquished by Relinquished by	Date/Time. 223 42	2 (220	company			Recei	ed by	er S	<u></u>	K		Dat	te/Time:	2.	(220 Company
Relinquished by englished	Date/Time: 23/2_1/045 Company										12 1104 Company					
Relinquished €y.	Date/Time: Company					Received by: Date/Tigle:						// /	Company			
Custody Seals Intact: Custody Seal No.: Δ Yes Δ No							Cooler	Tem	peratu	ıre(s) °C a	and Othe	Remarks:		6.	1)	1117
TAL 0045 000 4444														JV 7	<u> </u>	















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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc. TestAmerica Westfield Westfield Executive Park 53 Southampton Road Westfield, MA 01085

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY

Tel: (413)572-4000

TestAmerica Job ID: 360-39262-1

Client Project/Site: Olin Chemical Quarterly Groundwater

For:

Olin Corporation PO BOX 248 Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by: 3/8/2012 10:42:15 AM

Joe Chimi

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Olin Corporation

TestAmerica Job ID: 360-39262-1 Project/Site: Olin Chemical Quarterly Groundwater

Job ID: 360-39262-1

Laboratory: TestAmerica Westfield

Narrative

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 02/23/2012; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 6.0 C.

DISSOLVED METALS (ICP)

Samples OC-GW-202D (360-39262-1), OC-GW-202S (360-39262-2), OC-GW-202SDUP (360-39262-3), OC-PZ-25 (360-39262-4) and OC-PZ-24 (360-39262-5) were analyzed for dissolved metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were analyzed on 03/06/2012.

Sample OC-GW-202D (360-39262-1)[2X] required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the metals (ICP) analyses.

All quality control parameters were within the acceptance limits.

ANIONS (28 DAY HOLD TIME)

Samples OC-GW-202D (360-39262-1), OC-GW-202S (360-39262-2), OC-GW-202SDUP (360-39262-3), OC-PZ-25 (360-39262-4) and OC-PZ-24 (360-39262-5) were analyzed for anions (28 day hold time) in accordance with EPA Method 300.0. The samples were analyzed on 02/28/2012 and 03/02/2012.

Chloride and Sulfate failed the recovery criteria high for the MS of sample OC-GW-202S (360-39262-2) in batch 360-88087. Chloride exceeded the rpd limit for the MSD of sample OC-GW-202SMSD (360-39262-2) in batch 360-88087. The associated LCS recovered within control limits. Refer to the QC report for details.

Samples OC-GW-202D (360-39262-1)[10X], OC-GW-202D (360-39262-1)[50X], OC-GW-202S (360-39262-2)[10X], OC-GW-202SDUP (360-39262-3)[10X], OC-PZ-25 (360-39262-4)[10X] and OC-PZ-24 (360-39262-5)[10X] required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the anions analyses.

All other quality control parameters were within the acceptance limits.

AMMONIA

Samples OC-GW-202D (360-39262-1), OC-GW-202S (360-39262-2), OC-GW-202SDUP (360-39262-3), OC-PZ-25 (360-39262-4) and OC-PZ-24 (360-39262-5) were analyzed for ammonia in accordance with Lachat 107-06-1B. The samples were prepared on 02/27/2012 and 03/02/2012 and analyzed on 02/27/2012 and 03/05/2012.

Ammonia failed the recovery criteria low for the MS of sample OC-GW-202S (360-39262-2) in batch 360-87850. Ammonia failed the recovery criteria high for the MSD of sample OC-GW-202S (360-39262-2) in batch 360-87850 and exceeded the rpd limit. The associated LCS recovered within control limits. Refer to the QC report for details.

Case Narrative

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Job ID: 360-39262-1 (Continued)

Laboratory: TestAmerica Westfield (Continued)

Samples OC-GW-202D (360-39262-1)[20X], OC-GW-202S (360-39262-2)[10X], OC-GW-202SDUP (360-39262-3)[10X], OC-PZ-25 (360-39262-4)[10X] and OC-PZ-24 (360-39262-5)[10X] required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the ammonia analyses.

All other quality control parameters were within the acceptance limits.

SPECIFIC CONDUCTIVITY

Samples OC-GW-202D (360-39262-1), OC-GW-202S (360-39262-2), OC-GW-202SDUP (360-39262-3), OC-PZ-25 (360-39262-4) and OC-PZ-24 (360-39262-5) were analyzed for specific conductivity in accordance with SM20 2510B. The samples were analyzed on 03/01/2012.

No difficulties were encountered during the conductivity analyses.

All quality control parameters were within the acceptance limits.

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	MassDEP Analytical Protocol Certification Form												
Laboi	ratory Name:	TestAmeric	a Westfield		Project	#:	360-3926	62-1					
Proje	ect Location:	Wilmi	ngton		RT	N:							
This f	form provide			data	a set: list Labora	to	ry Sample ID Number(s):						
360-3	9262-(1-5)												
Matric	ces: X	Groundwater/Surfa	ce Water		Soil/Sediment		Drinking Water ☐ Air	Oth	her:				
		(check all that ap	ply below):										
8260 VOC 7470/7471 Hg Mass DEP VPH 8081 Pesticides 7196 Hex Cr									P APH				
CAM	II A ⊔ SVOC	CAM III B	CAM IV A Mass DEP EP		CAM V B L 8151 Herbicides]	CAM VI B 8330 Explosives	CAM IX A TO-15 VO					
CAM		CAM III C	CAM IV B		CAM V C	1	CAM VIII A	CAM IX B					
					9014 Total		_						
	Metals	6020 Metals	8082 PCB		Cyanide/PAC	7	6860 Perchlorate						
CAM		CAM III D	CAM V A	<u> </u>	CAM VI A	<u></u>	CAM VIII B						
	Affirmative	Responses to Que	stions A thro	ugh	F are required fo	r "	Presumptive Certainty" st	atus I					
Α		•					d on the Chain-of-Custody,						
	method hold		nperature) in ti	те пе	eid of laboratory, a	aric	I prepared/analyzed within	X Yes	☐ No				
В	Were the an protocol(s) for	. ,	nd all associate	ed Q	C requirements s	peo	cified in the selected CAM	XYes	☐ No				
С		uired corrective action	•		•	•	ecified in the selected CAM aformances?	XYes	□ No				
							ecified in CAM VII A,						
D	Data"?						nd Reporting of Analytical	X Yes	☐ No				
_		I and APH Methods	•				<u> </u>	Yes	☐ No				
E		(s)? (Refer to the ind TO-15 Methods only			_		, , , , , , , , , , , , , , , , , , ,	Yes	☐ No				
F	Were all app	licable CAM protoco	ol QC and perf	orma	ince standard nor	1-C(onformances identified and stions A through E)?	X Yes	□ No				
			, ,				sumptive Certainty" status						
G	1	porting limits at or be											
	protocol(s)?							X Yes	□ No¹				
		ata that achieve "Pr requirements descr	•	•	•		essarily meet the data usabi -07-350	lity and					
		performance stand						X Yes	No ¹				
ı		<u>'</u>					ted CAM protocol(s) ?	Yes	X No ¹				
¹ All n	•	nses must be addre			•								
							oon my personal inquiry of th	ose respor	nsible for				
	obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.												
Signa	ture:	State	ntura		Position	on:	Laboratory D	Director					
Printe	d Name:	Steven C.	Hartmann		Da	te:	3/8/12 10):25					
This forn	is form has been electronically signed and approved												

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Lab Sample ID: 360-39262-1

Lab Sample ID: 360-39262-2

Lab Sample ID: 360-39262-3

Lab Sample ID: 360-39262-4

Lab Sample ID: 360-39262-5

Client Samp	ple ID:	OC-GW	I-202D
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Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	14000		200	26	ug/L	2	_	6010C	Dissolved
Chromium	980		10	1.3	ug/L	2		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	1800		100	100	mg/L	50	_	300.0	Total/NA
Chloride	280		10	10	mg/L	10		300.0	Total/NA
Ammonia	310		2.0	2.0	mg/L	20		L107-06-1B	Total/NA
Specific Conductance	4500		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-202S

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	3.3	J	5.0	0.66	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	360		20	20	mg/L	10	_	300.0	Total/NA
Chloride	47		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	73		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1100		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-202SDUP

Analyte Chromium		Qualifier	RL 5.0	MDL 0.66		Dil Fac	<u>D</u>	Method 6010C	Prep Type Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	350		20	20	mg/L	10	_	300.0	Total/NA
Chloride	46		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	66		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1100		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-25

Analyte Chromium	Result 8.0	Qualifier	RL 5.0	MDL 0.66	Unit ug/L	Dil Fac	D	Method 6010C	Prep Type Dissolved
Analyte	Result (Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	460		20	20	mg/L	10		300.0	Total/NA
Chloride	19		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	46		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-24

 Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	23		5.0	0.66	ug/L	1	_	6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	720		20	20	mg/L	10	_	300.0	Total/NA
Chloride	26		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	60		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1900		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

TestAmerica Westfield 3/8/2012

Method Summary

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL WFD
300.0	Chloride & Sulfate	40CFR136A	TAL WFD
L107-06-1B	Nitrogen Ammonia	LACHAT	TAL WFD
SM 2510B	Conductivity, Specific Conductance	SM	TAL WFD

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

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Sample Summary

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
360-39262-1	OC-GW-202D	Water	02/22/12 07:55	02/23/12 16:45
360-39262-2	OC-GW-202S	Water	02/22/12 08:30	02/23/12 16:45
360-39262-3	OC-GW-202SDUP	Water	02/22/12 08:30	02/23/12 16:45
360-39262-4	OC-PZ-25	Water	02/22/12 10:30	02/23/12 16:45
360-39262-5	OC-PZ-24	Water	02/22/12 11:10	02/23/12 16:45

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Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-GW-202D

Date Collected: 02/22/12 07:55 Date Received: 02/23/12 16:45 Lab Sample ID: 360-39262-1

Matrix: Water

Method: 6010C - Metals (ICP) - Disc	solved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	14000		200	26	ug/L			03/06/12 17:06	2
Chromium	980		10	1.3	ug/L			03/06/12 17:06	2
<u></u>									

General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1800		100	100	mg/L			03/02/12 15:57	50
Chloride	280		10	10	mg/L			02/28/12 02:45	10
Ammonia	310		2.0	2.0	mg/L		02/27/12 10:48	02/27/12 15:58	20
Specific Conductance	4500		1.0	1.0	umhos/cm			03/01/12 09:46	1

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Client: Olin Corporation

Chloride

Ammonia

Specific Conductance

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-GW-202S

Date Collected: 02/22/12 08:30 Date Received: 02/23/12 16:45 Lab Sample ID: 360-39262-2

03/02/12 11:58

02/27/12 15:59

03/01/12 09:42

02/27/12 10:48

Matrix: Water

Method: 6010C - Metals (ICP) -	Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND ND	100	13	ug/L			03/06/12 16:19	1
Chromium	3.3 J	5.0	0.66	ug/L			03/06/12 16:19	1
General Chemistry								
Analyte	Result Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	360	20	20	mg/L			03/02/12 12:15	10

1.0

1.0

1.0

1.0 mg/L

1.0 mg/L

1.0 umhos/cm

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Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Lab Sample ID: 360-39262-3

Client Sample ID: OC-GW-202SDUP

Date Collected: 02/22/12 08:30

Matrix: Water

Date Received: 02/23/12 16:45

Method: 6010C - Metals (ICP) -	Dissolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:30	1
Chromium	3.4	J	5.0	0.66	ug/L			03/06/12 16:30	1
General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	350		20	20	mg/L			02/28/12 03:19	10
Chloride	46		1.0	1.0	mg/L			02/28/12 03:02	1
Ammonia	66		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 16:04	10
Specific Conductance	1100		1.0	1.0	umhos/cm			03/01/12 09:48	1

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Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-PZ-25 Lab San

Lab Sample ID: 360-39262-4

Date Collected: 02/22/12 10:30 Matrix: Water Date Received: 02/23/12 16:45

Method: 6010C - Metals (ICP) - D	ssolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:33	1
Chromium	8.0		5.0	0.66	ug/L			03/06/12 16:33	1
General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	460		20	20	mg/L			02/28/12 03:53	10
Chloride	19		1.0	1.0	mg/L			02/28/12 03:36	1
Ammonia	46		1.0	1.0	mg/L		03/02/12 12:16	03/05/12 17:30	10
Specific Conductance	1300		1.0	1.0	umhos/cm			03/01/12 09:49	1

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Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-PZ-24

Date Collected: 02/22/12 11:10 Date Received: 02/23/12 16:45 Lab Sample ID: 360-39262-5

Matrix: Water

Method: 6010C - Metals (ICP) - Diss	solved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:36	1
Chromium	23		5.0	0.66	ug/L			03/06/12 16:36	1
_									

General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	720		20	20	mg/L			02/28/12 18:59	10
Chloride	26		1.0	1.0	mg/L			02/28/12 18:42	1
Ammonia	60		1.0	1.0	mg/L		03/02/12 12:16	03/05/12 17:31	10
Specific Conductance	1900		1.0	1.0	umhos/cm			03/01/12 09:51	1

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Definitions/Glossary

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

Toxicity Equivalent Quotient (Dioxin)

TestAmerica Job ID: 360-39262-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description	
4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not	_
	applicable.	
F	MS or MSD exceeds the control limits	
F	RPD of the MS and MSD exceeds the control limits	

Glossary

TEQ

Abbreviation	These commonly used abbreviations may or may not be present in this report.
‡	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
EF	Toxicity Equivalent Factor (Dioxin)

QC Association Summary

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Metals

Analysis Batch: 88130

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Dissolved	Water	6010C	
360-39262-2	OC-GW-202S	Dissolved	Water	6010C	
360-39262-2 MS	OC-GW-202S	Dissolved	Water	6010C	
360-39262-2 MSD	OC-GW-202S	Dissolved	Water	6010C	
360-39262-3	OC-GW-202SDUP	Dissolved	Water	6010C	
360-39262-4	OC-PZ-25	Dissolved	Water	6010C	
360-39262-5	OC-PZ-24	Dissolved	Water	6010C	
LCS 360-88130/1	Lab Control Sample	Total/NA	Water	6010C	
LCSD 360-88130/13	Lab Control Sample Dup	Total/NA	Water	6010C	
MB 360-88130/2	Method Blank	Total/NA	Water	6010C	

General Chemistry

Prep Batch: 87823

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Total/NA	Water	Distill/Ammonia	
360-39262-2	OC-GW-202S	Total/NA	Water	Distill/Ammonia	
360-39262-2 MS	OC-GW-202S	Total/NA	Water	Distill/Ammonia	
360-39262-2 MSD	OC-GW-202S	Total/NA	Water	Distill/Ammonia	
360-39262-3	OC-GW-202SDUP	Total/NA	Water	Distill/Ammonia	
LCS 360-87823/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 360-87823/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 87850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Total/NA	Water	L107-06-1B	87823
360-39262-2	OC-GW-202S	Total/NA	Water	L107-06-1B	87823
360-39262-2 MS	OC-GW-202S	Total/NA	Water	L107-06-1B	87823
360-39262-2 MSD	OC-GW-202S	Total/NA	Water	L107-06-1B	87823
360-39262-3	OC-GW-202SDUP	Total/NA	Water	L107-06-1B	87823
LCS 360-87823/2-A	Lab Control Sample	Total/NA	Water	L107-06-1B	87823
MB 360-87823/1-A	Method Blank	Total/NA	Water	L107-06-1B	87823

Analysis Batch: 87944

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Total/NA	Water	300.0	
360-39262-3	OC-GW-202SDUP	Total/NA	Water	300.0	
360-39262-3	OC-GW-202SDUP	Total/NA	Water	300.0	
360-39262-4	OC-PZ-25	Total/NA	Water	300.0	
360-39262-4	OC-PZ-25	Total/NA	Water	300.0	
LCS 360-87944/6	Lab Control Sample	Total/NA	Water	300.0	
MB 360-87944/5	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 87947

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method Prep Batch
360-39262-5	OC-PZ-24	Total/NA	Water	300.0
360-39262-5	OC-PZ-24	Total/NA	Water	300.0
LCS 360-87947/4	Lab Control Sample	Total/NA	Water	300.0
MB 360-87947/3	Method Blank	Total/NA	Water	300.0

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QC Association Summary

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

General Chemistry (Continued)

Analysis Batch: 87959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Total/NA	Water	SM 2510B	
360-39262-2	OC-GW-202S	Total/NA	Water	SM 2510B	
360-39262-2 DU	OC-GW-202S	Total/NA	Water	SM 2510B	
360-39262-3	OC-GW-202SDUP	Total/NA	Water	SM 2510B	
360-39262-4	OC-PZ-25	Total/NA	Water	SM 2510B	
360-39262-5	OC-PZ-24	Total/NA	Water	SM 2510B	
LCS 360-87959/1	Lab Control Sample	Total/NA	Water	SM 2510B	
MB 360-87959/3	Method Blank	Total/NA	Water	SM 2510B	

Prep Batch: 88011

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-4	OC-PZ-25	Total/NA	Water	Distill/Ammonia	
360-39262-5	OC-PZ-24	Total/NA	Water	Distill/Ammonia	
LCS 360-88011/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 360-88011/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 88087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Total/NA	Water	300.0	
360-39262-2	OC-GW-202S	Total/NA	Water	300.0	
360-39262-2	OC-GW-202S	Total/NA	Water	300.0	
360-39262-2 MS	OC-GW-202S	Total/NA	Water	300.0	
360-39262-2 MSD	OC-GW-202S	Total/NA	Water	300.0	
LCS 360-88087/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88087/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 88088

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-4	OC-PZ-25	Total/NA	Water	L107-06-1B	88011
360-39262-5	OC-PZ-24	Total/NA	Water	L107-06-1B	88011
LCS 360-88011/2-A	Lab Control Sample	Total/NA	Water	L107-06-1B	88011
MB 360-88011/1-A	Method Blank	Total/NA	Water	L107-06-1B	88011

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4.0

13

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 360-88130/2

Matrix: Water

Analysis Batch: 88130

Client Sample ID: Method	l Blank
Prep Type: To	otal/NA

мв мв Result Qualifier RL MDL Unit D Dil Fac Analyte Prepared Analyzed 13 ug/L Aluminum 100 ND 03/06/12 16:13 Chromium ND 5.0 03/06/12 16:13 0.66 ug/L

Lab Sample ID: LCS 360-88130/1 Client Sample ID: Lab Control Sample **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88130

-	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Aluminum	 5000	5270		ug/L		105	80 - 120	
Chromium	1000	1040		ug/L		104	80 - 120	

Lab Sample ID: LCSD 360-88130/13 Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88130

	Si	ike LCSI	LCSD				%Rec.		RPD
Analyte	Ad	ded Resul	t Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Aluminum		5230	<u> </u>	ug/L		105	80 - 120	1	20
Chromium	1	000 1030)	ug/L		103	80 - 120	0	20

Lab Sample ID: 360-39262-2 MS Client Sample ID: OC-GW-202S **Matrix: Water Prep Type: Dissolved**

Analysis Batch: 88130

•	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Aluminum	ND		5000	5260		ug/L		105	75 - 125	
Chromium	3.3	J	1000	1010		ug/L		101	75 - 125	

Lab Sample ID: 360-39262-2 MSD Client Sample ID: OC-GW-202S **Prep Type: Dissolved**

Matrix: Water

Analysis Batch: 88130

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Aluminum	ND		5000	5250		ug/L		105	75 - 125	0	20
Chromium	3.3	J	1000	1010		ug/L		101	75 - 125	0	20

Method: 300.0 - Chloride & Sulfate

Lab Sample ID: MB 360-87944/5 Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analysis Batch: 87944

	MB	MB							
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			02/27/12 21:37	1
Chloride	ND		1.0	1.0	mg/L			02/27/12 21:37	1

Lab Sample ID: LCS 360-87944/6 **Client Sample ID: Lab Control Sample**

Matrix: Water

Analysis Batch: 87944

ı		Spike	LCS	LCS				%Rec.	
	Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
	Sulfate	80.0	80.6		mg/L	_	101	85 - 115	

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Client Sample ID: Lab Control Sample

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

85 - 115

Client Sample ID: Lab Control Sample

Client Sample ID: Method Blank

102

Project/Site: Olin Chemical Quarterly Groundwater

Method: 300.0 - Chloride & Sulfate (Continued)

Matrix: Water

Analysis Batch: 87944

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D Limits %Rec Chloride 40.0 40.5 101 85 - 115 mg/L

Lab Sample ID: MB 360-87947/3

Lab Sample ID: LCS 360-87944/6

Matrix: Water

Analysis Batch: 87947

	MB	MB							
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L	 _		02/28/12 16:59	1
Chloride	ND		1.0	1.0	mg/L			02/28/12 16:59	1

Lab Sample ID: LCS 360-87947/4

Matrix: Water

Analysis Batch: 87947

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit %Rec Limits Sulfate 80.0 81.6 mg/L 102 85 _ 115

40.8

mg/L

40.0

Lab Sample ID: MB 360-88087/3

Matrix: Water

Chloride

Analysis Batch: 88087

мв мв

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			03/02/12 11:06	1
Chloride	ND		1.0	1.0	mg/L			03/02/12 11:06	1

Lab Sample ID: LCS 360-88087/4

Matrix: Water

Analysis Batch: 88087

	Spike	LCS	LCS				%Rec.		
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Sulfate	 80.0	81.4		mg/L		102	85 - 115		_
Chlorido	40.0	40.7		ma/l		102	05 115		

Matrix: Water

Analysis Batch: 88087

L	Cilionae	40.0	40.7	mg/L	102 05 - 115
I	Lab Sample ID: 360-39262-2 MS				Client Sample ID: OC-GW-202S
П					

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Sulfate	360		200	633	F	mg/L	_	137	75 - 125	
Chloride	45		100	171	F	mg/L		126	75 - 125	

Lab Sample ID: 360-39262-2 MSD

Matrix: Water

Analysis Batch: 88087

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Sulfate	360		200	518		mg/L		80	75 - 125	20	20
Chloride	45		100	139	F	mg/L		94	75 - 125	21	20

TestAmerica Westfield 3/8/2012

Page 18 of 35

Prep Type: Total/NA

Client Sample ID: OC-GW-202S

Prep Type: Total/NA

TestAmerica Job ID: 360-39262-1

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Limits

%Rec.

Limits

%Rec.

Limits

90 - 110

Client Sample ID: Method Blank

Analyzed

03/05/12 17:04

Client Sample ID: Lab Control Sample

Limits

90 - 110

90 - 110

Client Sample ID: OC-GW-202S

90 - 110

Client Sample ID: OC-GW-202S

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Batch: 87823

24

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Dil Fac

Prep Batch: 88011

Prep Batch: 88011

Prep Batch: 87823

Prep Batch: 87823

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

Method: L107-06-1B - Nitrogen Ammonia

Lab Sample ID: MB 360-87823/1-A

Matrix: Water

Analysis Batch: 87850

Prep Type: Total/NA Prep Batch: 87823

LCS LCS

MS MS

MSD MSD

98.0 4 F

Result Qualifier

RL Unit

0.10 mg/L

LCS LCS

10.3

Result Qualifier

76.9

Result Qualifier

10.9

Result Qualifier

Unit

mg/L

Unit

mg/L

Unit

mg/L

Unit

mg/L

D

D

D

%Rec

%Rec

%Rec

Prepared

03/02/12 12:16

D

%Rec

103

248

38

109

мв мв

Sample Sample

Sample Sample

73

Result Qualifier

MR MR Result Qualifier

ND

73

Result Qualifier

Result Qualifier RL RL Unit Analyte D Prepared Dil Fac Analyzed 0.10 0.10 mg/L 02/27/12 10:48 Ammonia ND 02/27/12 15:28

> Spike Added

> > 10.0

Spike

Added

Spike

Added

Spike

Added

10.0

10.0

RL

0.10

10.0

Lab Sample ID: LCS 360-87823/2-A

Matrix: Water

Analysis Batch: 87850

Analyte Ammonia

Lab Sample ID: 360-39262-2 MS

Matrix: Water

Analysis Batch: 87850

Analyte Ammonia

Lab Sample ID: 360-39262-2 MSD

Matrix: Water

Ammonia

Analysis Batch: 87850

Analyte

Lab Sample ID: MB 360-88011/1-A

Matrix: Water

Analysis Batch: 88088

Analyte Ammonia

Lab Sample ID: LCS 360-88011/2-A

Matrix: Water

Analyte

Ammonia

Analysis Batch: 88088

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 360-87959/3

Matrix: Water

Analysis Batch: 87959

Analyte

Specific Conductance

Result Qualifier ND

MB MB

RL 1.0

RL Unit umhos/cm

D

Prepared Analyzed

03/01/12 09:22

Client Sample ID: Method Blank

10

RPD

Limit

Dil Fac

QC Sample Results

Client: Olin Corporation TestAmerica Job ID: 360-39262-1

Project/Site: Olin Chemical Quarterly Groundwater

Method: SM 2510B - Conductivity, Specific Conductance (Continued)

Lab Sample ID: LCS 360-87959/1

Matrix: Water

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

LCS LCS

Analysis Batch: 87959

Analyte Added Result Qualifier Unit D %Rec Limits
Specific Conductance 1410 1400 umhos/cm 99 85 - 115

Spike

Lab Sample ID: 360-39262-2 DU Client Sample ID: OC-GW-202S

Matrix: Water Prep Type: Total/NA

Analysis Batch: 87959

 Sample
 Sample
 DU
 DU
 RPD

 Analyte
 Result
 Qualifier
 Qualifier
 Unit
 D
 RPD
 Limit

 Specific Conductance
 1100
 1110
 umhos/cm
 0.2
 20

2

6

%Rec.

7

8

10

13

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DILUTION LOGS

Date: 2/27/12

												Date.	- Jan / 1 -
										Serial	Dilution		
Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
Ams	2/27/12	300.0	3926241	ÍQ x	1	MV	lγ	mL					
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Date: 23812

		reputation 209							Serial Dilution				
Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
	21/36/15		39262 AZ	(0		ml	10	mL					
13.			MS										
			MSD										
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			491278121	10	1	ML	12	ML					
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Date: 2/27/12

	 											Date.	
										Serial	Dilution		
Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
Amis	2/27/12	300.0	3926241	10 x	1	my	10	ml					
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TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 238/12

		cparation 209							Serial Dilution		•		
Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
	21/26/17		39262 AZ	(0	(ml	10	mL					
13.			ms										
			MSD				 				<u> </u>		
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			49278121	10	1	ML	12	ML					
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Date: $\frac{3}{2}$ | 12

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Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
19149	3/2/12	300.0	39262AZ	10%	ĺ	mu	0	ml					19 13
			39262AZ MS	101		mL		1					·
			↓ MSD	lOx	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	mL							
1	7	y	39 262 PM	50x	200	ML	1						3
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3-6-12 Date:

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Analyst						1	1	1		Serial	Dilution		
Initials	Date	Method	LIMs Sample ID	Rpťd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final		
1	36-12	6010 D	39262-1	ZX	5	m	10	M	Anquot 2	Units	Volume 2	Units	Comments
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3/8/2012 BL-QA-025



























Date:

2-27-12

TestAmerica Westfield

Analytical Dilution Preparation Log

										Serial i	Dilution		
Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
Rue	2-33-17	NH3	39255C1A	lox	(mL	lo	ml			X. 1.		
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TestAmerica Westfield



Analytical Dilution Preparation Log















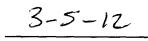
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Date	Method	LIMs Sample ID	Rpťd DII.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
3-5-12	NH3	3931441	ゴ×	2	ML	D	mh					
		MS	57	2					l. Pa			
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"		39262C4	10%	(1,	1,	1					
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			3-5-12 NH3 393/4A1	3-5-12 NH3 39314A1 5x MS 5X J MSD 5X 39262C4 lox	Method Clims Sample 1D Rept d Dil. Aliquot 1 $393/441 3x 2$ $MS 5y 2$ $MSD 5x 2$ $39262C4 lox l$	Method Lims Sample 10 Rptd Dil. Aliquot 1 Units $3-5-12$ NH3 $393/441$ $3x$ 2 Wh $393/441$ $3x$ 2 Wh $392/6204$ $392/6204$ $392/6204$	Method Clims Sample ID Rptd Dil. Aliquot 1 Units Volume 1	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Date Method LIMs Sample ID Rptd Dil. Aliquot 1 Units Volume 1 Units Aliquot 2 -5-12 N#3 39314 ft 5x 2 Wh D Wh	Date Method LIMs Sample ID Rpt'd DII. Sample Aliquot 1 Units Volume 1 Units Sample Aliquot 2 Units Sample Aliquot	Date Method LIMs Sample ID Rpt'd Dil. Aliquot 1 Units Volume 1 Units Aliquot 2 Units Volume 2	Date Method LIMS Sample ID Rpt'd Dil. Sample Aliquot 1 Units Volume 1 Units Aliquot 2 Units Volume 2 Units Pinal V

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

Lab Sample ID: 360-39262-1

Lab Sample ID: 360-39262-2

Lab Sample ID: 360-39262-3

Lab Sample ID: 360-39262-4

TestAmerica Job ID: 360-39262-1

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Client Sample ID: OC-GW-202D

Date Collected: 02/22/12 07:55 Date Received: 02/23/12 16:45

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		2	88130	03/06/12 17:06	TJS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		20	87850	02/27/12 15:58	RWE	TAL WFD
Total/NA	Analysis	300.0		10	87944	02/28/12 02:45	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:46	AMS	TAL WFD
Total/NA	Analysis	300.0		50	88087	03/02/12 15:57	AMS	TAL WFD

Client Sample ID: OC-GW-202S

Date Collected: 02/22/12 08:30

Date Received: 02/23/12 16:45

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C			88130	03/06/12 16:19	TJS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:59	RWE	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:42	AMS	TAL WFD
Total/NA	Analysis	300.0		1	88087	03/02/12 11:58	AMS	TAL WFD
Total/NA	Analysis	300.0		10	88087	03/02/12 12:15	AMS	TAL WFD

Client Sample ID: OC-GW-202SDUP

Date Collected: 02/22/12 08:30

Date Received: 02/23/12 16:45

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C			88130	03/06/12 16:30	TJS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 16:04	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87944	02/28/12 03:02	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87944	02/28/12 03:19	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:48	AMS	TAL WFD

Client Sample ID: OC-PZ-25

Date Collected: 02/22/12 10:30

Date Received: 02/23/12 16:45

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88130	03/06/12 16:33	TJS	TAL WFD
Total/NA	Analysis	300.0		1	87944	02/28/12 03:36	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87944	02/28/12 03:53	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:49	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88011	03/02/12 12:16	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	88088	03/05/12 17:30	RWE	TAL WFD

TestAmerica Westfield 3/8/2012

Lab Chronicle

Client: Olin Corporation

Client Sample ID: OC-PZ-24

Date Collected: 02/22/12 11:10

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Lab Sample ID: 360-39262-5

Matrix: Water

Date Received: 02/23/12 16:45

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C			88130	03/06/12 16:36	TJS	TAL WFD
Total/NA	Analysis	300.0		1	87947	02/28/12 18:42	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87947	02/28/12 18:59	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:51	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88011	03/02/12 12:16	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	88088	03/05/12 17:31	RWE	TAL WFD

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Certification Summary

Client: Olin Corporation

Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Westfield	Connecticut	State Program	1	PH-0494
TestAmerica Westfield	Maine	State Program	1	MA00014
TestAmerica Westfield	Massachusetts	State Program	1	M-MA014
TestAmerica Westfield	New Hampshire	NELAC	1	2539
TestAmerica Westfield	New York	NELAC	2	10843
TestAmerica Westfield	Rhode Island	State Program	1	LAO00057
TestAmerica Westfield	Vermont	State Program	1	VT-10843

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

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		State where P	State where Primary Accreditation is Carried						
		New Hampshire	-						
Method Name	Description	(NELAC)	Mass	Conn					
SM 4500 CI F	Chlorine, Residual		NP						
SM 9215E	Heterotrophic Plate Count (SimPlate)		Р						
SM 9222D	Coliforms, Fecal (Membrane Filter)		NP						
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P						
SM 9223	Coliforms, Total, and E.Coli (Enumeration)		Р						
1103.1	E.coli		ambient/						
Enterolert	Enterococcus		source						
200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	NP/P						
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P						
6010B/C	Metals (ICP)(list upon request)	NP/SW							
245.1	Mercury (CVAA)	NP/P	NP						
7470A	Mercury (CVAA)	NP							
7471A	Mercury (CVAA)	SW							
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP						
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P							
3010A	Preparation, Total Metals	NP/P							
3020A	Preparation, Total Metals	NP/P/SW							
3050B	Preparation, Metals	SW							
504.1	EDB, DBCP and 1,2,3-TCP (GC)	P	Р						
608	Organochlorine Pest/PCBs (list upon request)	NP	NP						
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP NP	NP						
3546	Microwave Extraction	SW	INI						
	Liquid-Liquid Extraction (Separatory Funnel)	NP NP							
3510C	· · · · · · · · · · · · · · · · · · ·	NP/SW							
8081A/B	Organochlorine Pesticides (GC)(list upon request)	NP/SW							
8082/A	PCBs by Gas Chromatography(list upon request)								
8270C/D	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		115/014					
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)	NP/SW		NP/SW					
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)	NP/SW							
524.2	Volatile Org Comp (GC/MS)(list upon request)	Р	P						
524.2	Trihalomethane compounds	Р	Р						
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP						
5035	Closed System Purge and Trap	SW							
5030B	Purge and Trap	NP							
8260B/C	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW							
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)								
180.1	Turbidity, Nephelometric	P	Р						
300	Anions, Ion Chromatography	NP/P	NP/P						
410.4	COD	NP	NP						
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW							
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP						
7196A	Chromium, Hexavalent	NP/SW							
9012A	Cyanide, Total and/or Amenable	NP/SW							
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP							
9045C	рН	SW							
L107041C	Nitrogen, Nitrate	NP	Р						
L107-06-1B	Nitrogen Ammonia	NP	NP						
L204001A CN	Cyanide, Total	P	NP/P						
L210-001A	Phenolics, Total Recoverable	NP	NP						
SM 2320B	Alkalinity	NP/P	NP/P						
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P						
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P						
SM 2540C SM 2540D	Solids, Total Dissolved (TDS) Solids, Total Suspended (TSS)	NP NP	NP						
SM 3500 CR D	Chromium, Hexavalent	NP NP	141						
SM 4500 CR D	pH	NP/P	NP/P						
	 '	NP NP	P NF/F						
SM 4500 NO2 B	Nitrogen, Nitrite	NP/P	NP						
SM 4500 P E	Phosphorus, Orthophosphate								
SM 4500 P E	Phosphorus, Total	NP ND	NP						
SM 4500 S2 D	Sulfide, Total	NP	NB						
SM 5210B	BOD, 5-Day	NP NP	NP						
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP						

Not all organic compounds are accreditied under NELAC For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory The lab carries additional accreditations with several states. This is the laboratories typical listing but is subject to change based on the laboratories current certification standing.

Login Sample Receipt Checklist

Client: Olin Corporation Job Number: 360-39262-1

Login Number: 39262 List Source: TestAmerica Westfield

List Number: 1

Creator: Ard, Vanessa L

oreator. Ard, variessa E		
Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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TestAmerica Westfield

Westfield Executive Park 53 Southampton Road Westfield, MA 01085

Phone (413) 572-4000 Fax (413) 572-3707

Boston Service Center

240 Bear Hill Rd. Suite 104 Waltham, MA 02451 Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

<u>TestAmerica</u>

THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	^ _1_	200	Lab F	PM:						Carrier Trackin	g No(s):		coc No: 21068
Client Information Client Contact Ancis Coshull Sampler: BRIAN GUCHARA Phone: 9786586141 E-Ma				ail:		·····							Page:	
Company:	1 7706	<u>>0013</u>	- 1	ŀ							_l			Job #:
Address: SI Rama & G.F.	Due Date Requests	ed:				1 1		-	1	Analysis R	equested	1 1 1		Preservation Codes:
							-	Œ						A - HCL J - DI Water
i policina i de la constanti d		FAT Requested (days):					***************************************	3	2	\$860,008 \$1405				B - NaOH M - Hexane C - Zn Acetate N - None
State, Zip: MA 0(88)								\ \{\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3	
Phone: 9786586121	Quote #:				1		l	Ammon	\simeq	<u> </u>				F - MeOH R - Na2S2SO3 H - Ascorbic Acid S - H2SO4
Email:	PO #:						Anna Channe	- 4	₫.	*				i - Ice Z - other (specify)
Project Name/number:	W0 #:				-		White Street	Si		7 3			ners	Regulatory programs: MCP
Sino: Quarterly Granduater	Derterly Franchisten				4	relqi		06	2				container	MCP GW1/S1 RCP CT RSR DEP Form EDD Required
wilmington	in lining ton			watrix	Itals	Sarr	MSD		引	2305			÷	
			Sample	(W=water,	18.	Field Filtered Sample?	Perform MS/MSD?	CACh - 107	6108-5142	29			Number	
		Sample	Type (C=comp,	Sesolid, Oewastoloii, BTeTissue,	Sampler's	id Fi	топ	숳	0	20120			Total N	TO PRINCIPAL DE LA CASA DE LA CAS
Sample Identification	Sample Date	Time	G=grab)	A-Air)	\s_s	띭	ے	اك	3	3			10	Special Instructions/Note:
				ation Code:	X	X	X,							
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6w 2025	9-99-12	8:30	6-	ω	 	ļ		ᅺ	زنخ	\times			12	600 2025 molvides
6w 2025 PZ-25	9-93-13		6	8					1				3	ms, msD, Dup
P2-24	9-99-19	11:10	6	W	.			<u> </u>	1-7				3	
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Possible Hazard Identification Non-Hazard Flammable Skin Irritant Po	oison B Un	known 🗀	Radiologi	'cal		Sar					Disposal By			ned longer than 1 month) chive For Months
Deliverable Requested: I, II, III, IV, Other (specify)	NGOTT D. CIT.	AIOWII	radiologi	oar .		Spe				s/QC Require	ements:	Lav	711	dilive for widning
Relinquished by	Date/Time.		[220	Company		•	Recei	ved b	ý.	\mathcal{L}	B	Date/Time:	ح.	_ {¿¿¿ Company
Relinquished by												Company		
			Company			Recei	ved by	<u></u>			Date/Time/	1)		
						Cooler Temperature(s) °C and Other Remarks:								
Custody Seals Intact: Custody Seal No.:						Coole	riem	peratu	ire(s) ⁻ C and Oth	er Remarks:		<u>L.</u>		















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FILE COPY

<u>TestAmerica</u>

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Westfield Westfield Executive Park 53 Southampton Road Westfield, MA 01085 Tel: (413)572-4000

OF PARAMETERS ORDERED BY:

TestAmerica Job ID: 360-39434-1 Client Project/Site: Olin Chemical

For:

Olin Corporation PO BOX 248 Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Jupth Clux

Authorized for release by: 3/21/2012 11:49:25 AM

Joe Chimi

Report Production Representative joe.chimi@testamericainc.com

Designee for

Becky Mason Project Manager II

becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Olin Corporation Project/Site: Olin Chemical TestAmerica Job ID: 360-39434-1

Job ID: 360-39434-1

Laboratory: TestAmerica Westfield

Narrative

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

Receipt

The samples were received on 03/07/2012; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.6°C.

GC/MS VOA

Method 8260C: The following sample was diluted due to the abundance of target analytes: OC-GW 16R (360-39434-1). Elevated reporting limits (RLs) are provided.

At the request of the client, a non-MCP compound list was reported for this job.

No other analytical or quality issues were noted.

GC/MS Semi VOA

Method 8270D: The method blank for batch 88223 contained Bis(2-ethylhexyl) phthalate above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

The following sample was diluted due to the abundance of target analytes: OC-GW 16R (360-39434-1). Elevated reporting limits (RLs) are provided. Consequently, all surrogates were diluted outside control limits.

At the request of the client, an abbreviated MCP compound list was reported for this job.

No other analytical or quality issues were noted.

GC VOA

Method MAVPH: The calibration curve uses quadratic regressions for m-Xylene & p-Xylene and C9-C10 Aromatics.

The following sample was diluted due to foaming at the time of purging during the original sample analysis: OC-GW 16R (360-39434-1). Elevated reporting limits (RLs) are provided.

Samples (360-39434-1 MS), (360-39434-1 MSD) and OC-GW 16R (360-39434-1) had a pH<2.

No other analytical or quality issues were noted.

Metals

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No analytical or quality issues were noted.

Field Service / Mobile Lab

No analytical or quality issues were noted.

General Chemistry

No analytical or quality issues were noted.

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Case Narrative

Client: Olin Corporation Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Job ID: 360-39434-1 (Continued)

Laboratory: TestAmerica Westfield (Continued)

Organic Prep

No analytical or quality issues were noted.

	MassDEP Analytical Protocol Certification Form											
Laboi	ratory N	Name:	TestAm	erica V	Vestfield		Pro	ject #:		360-3943	4-1	
Proje	ect Loc	ation:	Olin Chemi	cal Su	perfund S	Site		RTN:				
This f	form p	rovide	s certifications	for the	e followir	ng data	a set: list Lak	orato	ry Sample ID N	umber(s):		
360-3	9434-(1-3)										
Matric	ces:	X	Groundwater/S	urface \	Water		Soil/Sedimer	nt 🗌	Drinking Water	Air	Otl	her:
		cols (check all that		<u> </u>							
8260			7470/7471 Hg		ass DEP \		8081 Pestici	des	7196 Hex Cr		Mass DEF	
CAM	II A SVOC	X	CAM III B L		AM IV A ass DEP E	X	CAM V B 8151 Herbici	doc	CAM VI B 8330 Explosive		CAM IX A TO-15 VC	
CAM		X	CAM III C		AM IV B		CAM V C	ues	CAM VIII A	:s 	CAM IX B	
			•				9014 Total					
	Metals		6020 Metals CAM III D [82 PCB		Cyanide/PA		6860 Perchlora	ite		
CAM		X	<u> </u>		AM V A	<u> </u>	CAM VI A	<u> </u>	II.			
	Affirm	native	Responses to 0	Questi	ons A thr	ough F	F are require	d for '	Presumptive C	ertainty" st	atus I	
Α			•						ed on the Chain-	-		
			ing time.	j tempe	erature) in	the ne	id of laborato	ry, and	d prepared/analy	zea within	X Yes	☐ No
В			alytical method(: ollowed?	s) and a	all associa	ated Q0	C requiremen	ts spe	cified in the sele	cted CAM	XYes	☐ No
Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?											XYes	□ No
	i e								pecified in CAM	VII A,		
D	Data"	?							nd Reporting of	Analytical	X Yes	☐ No
_			and APH Meth		•				•		X Yes	☐ No
E						` '	-		t modifications). d for each meth		Yes	☐ No
F	Were	all app	licable CAM pro	tocol C	(C and pe	rforma	nce standard	non-c	onformances ide	entified and	X Yes	□ No
									sumptive Certa			
G	Were		oorting limits at o	or belov	v all CAM	reporti	ing limits spec	ified i	n the selected C	AM	Yes	X No ¹
	User N	Note: D			•	-	-		cessarily meet th	e data usabi		
	sentativ	eness/	requirements de	escribed	d in 310 C	MR 40.	1056 (2)(k) an	d WCS	S-07-350		<u> </u>	
Н	Were	all QC	performance st	andard	ls specifie	d in the	e CAM protoc	ol(s) a	chieved?		X Yes	No ¹
l	•						•		cted CAM protoc	ol(s) ?	Yes	X No ¹
			nses must be a									
obtair		inforn	nation, the mater						pon my personal he best of my kn			nsible for
			<u></u>	>/.		_						
Signa	ture:		20	Star.	lma		_ Po	sition:		Laboratory D	irector	
Printe	d Nam	e:	Stever	n C. Ha	ırtmann		<u>-</u>	Date		3/21/12 1	1:40	
This forn	n has bee	n electror	ically signed and appro	oved								

Client: Olin Corporation Project/Site: Olin Chemical

Client Sample ID: OC-GW 16R

TestAmerica Job ID: 360-39434-1

Lab Sample ID: 360-39434-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	1200		20	4.0	ug/L	20	_	8260C	Total/NA
2,4,4-Trimethyl-2-pentene	360		20	4.0	ug/L	20		8260C	Total/NA
N-Nitrosodiphenylamine - DL	330		94	9.4	ug/L	20		8270D	Total/NA
Iron	1900		100	21	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
o-Xylene	8.4		4.0	4.0	ug/L	4	_	MAVPH	Total/NA
C5-C8 Aliphatics (unadjusted)	1500		200	200	ug/L	4		MAVPH	Total/NA
C5-C8 Aliphatics (adjusted)	1500		200	200	ug/L	4		MAVPH	Total/NA
Total VPH	1500		200	200	ug/L	4		MAVPH	Total/NA
Ammonia	0.25		0.10	0.10	mg/L	1		L107-06-1B	Total/NA
Н	6.87	HF	0.100	0.100	SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: OC-GW 79S Lab Sample ID: 360-39434-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	16	J	100	13	ug/L	1	_	6010C	Dissolved
Chromium	5.6		5.0	0.66	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	1200		40	40	mg/L	20	_	300.0	Total/NA
Chloride	180		10	10	mg/L	10		300.0	Total/NA
Ammonia	140		2.0	2.0	mg/L	20		L107-06-1B	Total/NA
Specific Conductance	3000		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ 16RR Lab Sample ID: 360-39434-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	5.3		5.0	0.66	ug/L	1	_	6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	740		20	20	mg/L	10	_	300.0	Total/NA
Chloride	130		10	10	mg/L	10		300.0	Total/NA
Ammonia	110		2.0	2.0	mg/L	20		L107-06-1B	Total/NA
Specific Conductance	2100		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-Trip Blank

Lab Sample ID: 360-39434-4

No Detections

Method Summary

Client: Olin Corporation Project/Site: Olin Chemical TestAmerica Job ID: 360-39434-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds (GC/MS)	MA DEP	TAL WFD
8270D	Semivolatile Organic Compounds (GC/MS) Low Level	MA DEP	TAL WFD
MAVPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	TAL WFD
6010C	Metals (ICP)	SW846	TAL WFD
300.0	Chloride & Sulfate	40CFR136A	TAL WFD
L107-06-1B	Nitrogen Ammonia	LACHAT	TAL WFD
SM 2510B	Conductivity, Specific Conductance	SM	TAL WFD
SM 4500 H+ B	pH	SM	TAL WFD

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

MA DEP = Massachusetts Department Of Environmental Protection

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

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Sample Summary

Client: Olin Corporation Project/Site: Olin Chemical TestAmerica Job ID: 360-39434-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
360-39434-1	OC-GW 16R	Water	03/07/12 08:10	03/07/12 17:10
360-39434-2	OC-GW 79S	Water	03/07/12 10:00	03/07/12 17:10
360-39434-3	OC-PZ 16RR	Water	03/07/12 10:20	03/07/12 17:10
360-39434-4	OC-Trip Blank	Water	03/07/12 08:10	03/07/12 17:10

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Client: Olin Corporation Project/Site: Olin Chemical

Client Sample ID: OC-GW 16R

Date Collected: 03/07/12 08:10

2,5-Dibromotoluene (pid)

TestAmerica Job ID: 360-39434-1

Lab Sample ID: 360-39434-1

Matrix: Water

Date Received: 03/07/12 17:10

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level - DL

Method: 8260C - Volatile Orga	anic Compounds ((GC/MS)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	1200		20	4.0	ug/L			03/12/12 13:32	20
2,4,4-Trimethyl-2-pentene	360		20	4.0	ug/L			03/12/12 13:32	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	103		70 - 130			=		03/12/12 13:32	20
Taluana de (Cum)	100		70 - 130					03/12/12 13:32	20
Toluene-d8 (Surr)	700								

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	0.47	ug/L		03/08/12 15:24	03/09/12 15:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorophenol			15 - 110				03/08/12 15:24	03/09/12 15:22	1
Phenol-d5	23		15 - 110				03/08/12 15:24	03/09/12 15:22	1
Nitrobenzene-d5	61		30 - 130				03/08/12 15:24	03/09/12 15:22	1
2,4,6-Tribromophenol	92		15 - 110				03/08/12 15:24	03/09/12 15:22	1
Terphenyl-d14	93		30 - 130				03/08/12 15:24	03/09/12 15:22	1
2-Fluorobiphenyl	61		30 - 130				03/08/12 15:24	03/09/12 15:22	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	330		94	9.4	ug/L		03/08/12 15:24	03/14/12 16:47	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorophenol		DX	15 - 110				03/08/12 15:24	03/14/12 16:47	20
Phenol-d5	0	DX	15 - 110				03/08/12 15:24	03/14/12 16:47	20
Nitrobenzene-d5	0	DX	30 - 130				03/08/12 15:24	03/14/12 16:47	20
2,4,6-Tribromophenol	0	DX	15 - 110				03/08/12 15:24	03/14/12 16:47	20
Terphenyl-d14	0	DX	30 - 130				03/08/12 15:24	03/14/12 16:47	20
2-Fluorobiphenyl	0	DX	30 - 130				03/08/12 15:24	03/14/12 16:47	20

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.0	4.0	ug/L			03/20/12 01:18	4
Ethylbenzene	ND		4.0	4.0	ug/L			03/20/12 01:18	4
m-Xylene & p-Xylene	ND		8.0	8.0	ug/L			03/20/12 01:18	4
Methyl tert-butyl ether	ND		4.0	4.0	ug/L			03/20/12 01:18	4
Naphthalene	ND		20	20	ug/L			03/20/12 01:18	4
o-Xylene	8.4		4.0	4.0	ug/L			03/20/12 01:18	4
Toluene	ND		4.0	4.0	ug/L			03/20/12 01:18	4
C5-C8 Aliphatics (unadjusted)	1500		200	200	ug/L			03/20/12 01:18	4
C9-C12 Aliphatics (unadjusted)	ND		200	200	ug/L			03/20/12 01:18	4
C5-C8 Aliphatics (adjusted)	1500		200	200	ug/L			03/20/12 01:18	4
C9-C12 Aliphatics (adjusted)	ND		200	200	ug/L			03/20/12 01:18	4
C9-C10 Aromatics	ND		200	200	ug/L			03/20/12 01:18	4
Total VPH	1500		200	200	ug/L			03/20/12 01:18	4
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)	100		70 - 130			-		03/20/12 01:18	4

03/20/12 01:18

70 - 130

Client: Olin Corporation

Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Client Sample ID: OC-GW 16R

Lab Sample ID: 360-39434-1 Date Collected: 03/07/12 08:10 Matrix: Water

Date Received: 03/07/12 17:10

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	1900		100	21	ug/L			03/13/12 15:34	1
General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.25		0.10	0.10	mg/L		03/16/12 10:29	03/20/12 15:54	1
Allillollia	0.20								

Client: Olin Corporation Project/Site: Olin Chemical TestAmerica Job ID: 360-39434-1

Lab Sample ID: 360-39434-2

Matrix: Water

Date Collected: 03/07/12 10:00 Date Received: 03/07/12 17:10

Client Sample ID: OC-GW 79S

Method: 6010C - Metals (ICP)	- Dissolved								
Analyte	Result (Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	16		100	13	ug/L			03/13/12 15:47	1
Chromium	5.6		5.0	0.66	ug/L			03/13/12 15:47	1
General Chemistry	Pocult (Qualifier	DI	DI	Unit	D	Droporod	Analyzad	Dil Fac
	Analyte Aluminum Chromium	Aluminum 16 Chromium 5.6 General Chemistry	Analyte Result Qualifier Aluminum 16 J Chromium 5.6 General Chemistry	Analyte Result Aluminum Qualifier RL J Chromium 16 J 100 General Chemistry 5.6 5.0	Analyte Result Aluminum Qualifier RL J MDL J Chromium 16 J 100 13 Chromium 5.6 5.0 0.66	Analyte Result Aluminum Qualifier RL J MDL Unit Unit Unit Unit Unit Unit Unit Unit	Analyte Result Aluminum Qualifier RL Juminum MDL Junit Ug/L Ug/L D Chromium 5.6 5.0 0.66 ug/L General Chemistry	Analyte Result Aluminum Qualifier RL Unit Unit Ug/L D Verpared Chromium 16 J 100 13 ug/L 13 ug/L Chromium 5.6 5.0 0.66 ug/L 5.0 0.66 ug/L	Analyte Result Aluminum Qualifier RL DIVIDITION MDL Unit Unit Unit Unit Unit Unit Unit Unit

General Chemistry						_			
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1200		40	40	mg/L			03/16/12 22:40	20
Chloride	180		10	10	mg/L			03/16/12 03:05	10
Ammonia	140		2.0	2.0	mg/L		03/16/12 10:29	03/20/12 16:35	20
Specific Conductance	3000		1.0	1.0	umhos/cm			03/16/12 14:29	1

Client: Olin Corporation Project/Site: Olin Chemical TestAmerica Job ID: 360-39434-1

Lab Sample ID: 360-39434-3

03/16/12 14:30

Matrix: Water

Date Collected: 03/07/12 10:20

Client Sample ID: OC-PZ 16RR

Date Received: 03/07/12 17:10

Specific Conductance

Method: 6010C - Metals (ICP)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/13/12 15:50	1
Chromium	5.3		5.0	0.66	ug/L			03/13/12 15:50	1
General Chemistry									
Analyte	Pocult	Qualifier	RL	DI	Unit	D	Prepared	Analyzed	Dil Fac
Analyte	Result	Qualifier	NL	NL.	Offic		- riepaieu	Allalyzeu	Dil Fac
Sulfate	740		20	20	mg/L			03/16/12 03:36	10
Chloride	130		10	10	mg/L			03/16/12 03:36	10
Ammonia	110		2.0	2.0	mg/L		03/16/12 10:29	03/20/12 16:36	20

1.0

1.0 umhos/cm

Client: Olin Corporation TestAmerica Job ID: 360-39434-1
Project/Site: Olin Chemical

Client Sample ID: OC-Trip Blank

Lab Sample ID: 360-39434-4

Date Collected: 03/07/12 08:10 Matrix: Water

Date Received: 03/07/12 17:10

Method: 8260C - Volatile Organic Compounds (GC/MS)											
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac		
2,4,4-Trimethyl-1-pentene	ND		1.0	0.20	ug/L			03/12/12 13:53	1		
2,4,4-Trimethyl-2-pentene	ND		1.0	0.20	ug/L			03/12/12 13:53	1		
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac		
4-Bromofluorobenzene	101		70 - 130			=		03/12/12 13:53	1		
Toluene-d8 (Surr)	102		70 - 130					03/12/12 13:53	1		
Dibromofluoromethane	103		70 - 130					03/12/12 13:53	1		

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Definitions/Glossary

Client: Olin Corporation Project/Site: Olin Chemical TestAmerica Job ID: 360-39434-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
В	Compound was found in the blank and sample.
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
Metals	

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes

Glossary

RPD

TEF

TEQ

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit

Relative Percent Difference, a measure of the relative difference between two points

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

TestAmerica Job ID: 360-39434-1

Client: Olin Corporation Project/Site: Olin Chemical

GC/MS VOA

Analysis Batch: 88289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	8260C	
360-39434-4	OC-Trip Blank	Total/NA	Water	8260C	
LCS 360-88289/3	Lab Control Sample	Total/NA	Water	8260C	
LCSD 360-88289/4	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 360-88289/6	Method Blank	Total/NA	Water	8260C	

GC/MS Semi VOA

Prep Batch: 88223

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	3510C	
360-39434-1 - DL	OC-GW 16R	Total/NA	Water	3510C	
LCS 360-88223/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 360-88223/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 360-88223/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 88264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	8270D	88223
LCS 360-88223/2-A	Lab Control Sample	Total/NA	Water	8270D	88223
LCSD 360-88223/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	88223
MB 360-88223/1-A	Method Blank	Total/NA	Water	8270D	88223

Analysis Batch: 88375

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1 - DL	OC-GW 16R	Total/NA	Water	8270D	88223

GC VOA

Analysis Batch: 88571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	0-39434-1 OC-GW 16R		Water	MAVPH	
360-39434-1 MS	OC-GW 16R	Total/NA	Water	MAVPH	
360-39434-1 MSD	OC-GW 16R	Total/NA	Water	MAVPH	
LCS 360-88571/3	Lab Control Sample	Total/NA	Water	MAVPH	
LCSD 360-88571/4	Lab Control Sample Dup	Total/NA	Water	MAVPH	
MB 360-88571/6	Method Blank	Total/NA	Water	MAVPH	

Metals

Analysis Batch: 88389

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Dissolved	Water	6010C	
360-39434-1 DU	OC-GW 16R	Dissolved	Water	6010C	
360-39434-1 MS	OC-GW 16R	Dissolved	Water	6010C	
360-39434-2	OC-GW 79S	Dissolved	Water	6010C	
360-39434-3	OC-PZ 16RR	Dissolved	Water	6010C	
LCS 360-88389/1	Lab Control Sample	Total/NA	Water	6010C	
LCSD 360-88389/10	Lab Control Sample Dup	Total/NA	Water	6010C	
MB 360-88389/2	Method Blank	Total/NA	Water	6010C	

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QC Association Summary

Client: Olin Corporation Project/Site: Olin Chemical TestAmerica Job ID: 360-39434-1

General Chemistry

Analysis Batch: 88258

	Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
	360-39434-1	OC-GW 16R	Total/NA	Water	SM 4500 H+ B	
l	LCS 360-88258/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Prep Batch: 88493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	Distill/Ammonia	
360-39434-2	OC-GW 79S	Total/NA	Water	Distill/Ammonia	
360-39434-3	OC-PZ 16RR	Total/NA	Water	Distill/Ammonia	
LCS 360-88493/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 360-88493/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 88521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-2	OC-GW 79S	Total/NA	Water	SM 2510B	
360-39434-3	OC-PZ 16RR	Total/NA	Water	SM 2510B	
LCS 360-88521/1	Lab Control Sample	Total/NA	Water	SM 2510B	
MB 360-88521/3	Method Blank	Total/NA	Water	SM 2510B	

Analysis Batch: 88534

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-2	OC-GW 79S	Total/NA	Water	300.0	
360-39434-3	OC-PZ 16RR	Total/NA	Water	300.0	
LCS 360-88534/6	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88534/5	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 88537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-2	OC-GW 79S	Total/NA	Water	300.0	
LCS 360-88537/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88537/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 88618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	L107-06-1B	88493
360-39434-2	OC-GW 79S	Total/NA	Water	L107-06-1B	88493
360-39434-3	OC-PZ 16RR	Total/NA	Water	L107-06-1B	88493
LCS 360-88493/2-A	Lab Control Sample	Total/NA	Water	L107-06-1B	88493
MB 360-88493/1-A	Method Blank	Total/NA	Water	L107-06-1B	88493

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Client: Olin Corporation Project/Site: Olin Chemical

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Method: 8260C - Volatile Organic Compounds (GC/MS)

Matrix: Water Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)					
		BFB	TOL	DBFM			
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)			
360-39434-1	OC-GW 16R	103	100	101			
360-39434-4	OC-Trip Blank	101	102	103			
LCS 360-88289/3	Lab Control Sample	102	104	105			
LCSD 360-88289/4	Lab Control Sample Dup	102	104	103			
MB 360-88289/6	Method Blank	103	100	103			

Surrogate Legend

BFB = 4-Bromofluorobenzene

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Matrix: Water Prep Type: Total/NA

_				Percent Sur	rogate Reco	very (Accept	ance Limits
		2FP	PHL	NBZ	TBP	TPH	FBP
Lab Sample ID	Client Sample ID	(15-110)	(15-110)	(30-130)	(15-110)	(30-130)	(30-130)
360-39434-1	OC-GW 16R	29	23	61	92	93	61
60-39434-1 - DL	OC-GW 16R	0 D X	0 D X	0 D X	0 D X	0 D X	0 D X
CS 360-88223/2-A	Lab Control Sample	52	35	94	94	99	83
CSD 360-88223/3-A	Lab Control Sample Dup	51	34	94	99	109	83
MB 360-88223/1-A	Method Blank	56	35	97	93	102	84

Surrogate Legend

2FP = 2-Fluorophenol

PHL = Phenol-d5

NBZ = Nitrobenzene-d5

TBP = 2,4,6-Tribromophenol

TPH = Terphenyl-d14

FBP = 2-Fluorobiphenyl

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Matrix: Water Prep Type: Total/NA

				Percent Surrogate Recovery (Acceptance Limits)
		25DBT2	25DBT1	
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	
360-39434-1	OC-GW 16R	100	110	
360-39434-1 MS	OC-GW 16R	99	82	
360-39434-1 MSD	OC-GW 16R	99	79	
LCS 360-88571/3	Lab Control Sample	100	82	
LCSD 360-88571/4	Lab Control Sample Dup	101	83	
MB 360-88571/6	Method Blank	98	110	
Surrogate Legend				
25DBT = 2,5-Dibromotol	uene (fid)			

TestAmerica Job ID: 360-39434-1

Client: Olin Corporation Project/Site: Olin Chemical

Method: 8260C - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 360-88289/6 Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water Analysis Batch: 88289

MB MB RL Prepared Result Qualifier MDL Unit D Dil Fac Analyte Analyzed 2,4,4-Trimethyl-1-pentene ND 1.0 0.20 ug/L 03/12/12 10:59 2,4,4-Trimethyl-2-pentene ND 1.0 0.20 ug/L 03/12/12 10:59

MB MB %Recovery Qualifier Surrogate I imits Prepared Analyzed Dil Fac 4-Bromofluorobenzene 103 70 - 130 03/12/12 10:59 100 70 - 130 03/12/12 10:59 Toluene-d8 (Surr) Dibromofluoromethane 103 70 - 130 03/12/12 10:59

Lab Sample ID: LCS 360-88289/3 Client Sample ID: Lab Control Sample Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88289

LCS LCS Spike %Rec. Result Qualifier Analyte Added Unit D %Rec Limits 2,4,4-Trimethyl-1-pentene 20.0 23.0 ug/L 115 70 - 130 20.0 2,4,4-Trimethyl-2-pentene 22.9 ug/L 115 70 - 130

LCS LCS Surrogate %Recovery Qualifier Limits 70 - 130 4-Bromofluorobenzene 102 104 70 - 130 Toluene-d8 (Surr) Dibromofluoromethane 105 70 - 130

Lab Sample ID: LCSD 360-88289/4 Client Sample ID: Lab Control Sample Dup

Matrix: Water

Analysis Batch: 88289

Spike LCSD LCSD %Rec. RPD Analyte Added Result Qualifier Unit D %Rec Limits RPD Limit 20.0 22.1 70 - 130 20 2,4,4-Trimethyl-1-pentene ug/L 111 2,4,4-Trimethyl-2-pentene 20.0 22.6 ug/L 113 70 - 130 20

LCSD LCSD Surrogate %Recovery Qualifier Limits 4-Bromofluorobenzene 102 70 - 130 Toluene-d8 (Surr) 104 70 - 130 Dibromofluoromethane 103 70 - 130

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

MR MR

Lab Sample ID: MB 360-88223/1-A Client Sample ID: Method Blank Matrix: Water Prep Type: Total/NA Analysis Batch: 88264 Prep Batch: 88223

Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac 1.11 2.0 ug/L 03/08/12 15:24 03/09/12 19:32 Bis(2-ethylhexyl) phthalate J 0.50 N-Nitrosodiphenylamine ND 5.0 0.50 ug/L 03/08/12 15:24 03/09/12 19:32

	MB	MB				
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorophenol	56		15 - 110	03/08/12 15:24	03/09/12 19:32	1
Phenol-d5	35		15 - 110	03/08/12 15:24	03/09/12 19:32	1
Nitrobenzene-d5	97		30 - 130	03/08/12 15:24	03/09/12 19:32	1

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Prep Type: Total/NA

Client: Olin Corporation Project/Site: Olin Chemical TestAmerica Job ID: 360-39434-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level (Continued)

MD MD

Lab Sample ID: MB 360-88223/1-A

Matrix: Water

Analysis Batch: 88264

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 88223

Surrogate	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fa
2,4,6-Tribromophenol	93	15 - 110	03/08/12 15:24	03/09/12 19:32	
Terphenyl-d14	102	30 - 130	03/08/12 15:24	03/09/12 19:32	
2-Fluorobiphenyl	84	30 - 130	03/08/12 15:24	03/09/12 19:32	1

Lab Sample ID: LCS 360-88223/2-A

Matrix: Water

Analysis Batch: 88264

Client Sample ID: Lab Control Sample

Prep Type: Total/NA Prep Batch: 88223

Spike LCS LCS %Rec. Analyte Added Result Qualifier %Rec Limits Unit Bis(2-ethylhexyl) phthalate 8.00 8.25 ug/L 103 40 - 140 8.00 40 _ 140 N-Nitrosodiphenylamine 7.71 ug/L 96

LCS LCS Surrogate %Recovery Qualifier Limits 2-Fluorophenol 52 15 - 110 Phenol-d5 35 15 - 110 Nitrobenzene-d5 94 30 - 130 2,4,6-Tribromophenol 94 15 - 110 Terphenyl-d14 99 30 - 130 2-Fluorobiphenyl 83 30 - 130

Lab Sample ID: LCSD 360-88223/3-A

Matrix: Water

Analysis Batch: 88264

Cliant	Samn	יחו או	l ah	Control	Same	No Dun
CHEIL	Jailip	יטו פו	Lav	COILLIO	Jaili	ne Dup

Prep Type: Total/NA

Prep Batch: 88223

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Bis(2-ethylhexyl) phthalate	8.00	8.99		ug/L		112	40 - 140	9	20
N-Nitrosodiphenylamine	8.00	7.66		ug/L		96	40 - 140	1	20

its
110
110
130
110
130
130

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 360-88571/6 Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88571

	MB	MB							
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	1.0	ug/L			03/20/12 00:12	1
Ethylbenzene	ND		1.0	1.0	ug/L			03/20/12 00:12	1
m-Xylene & p-Xylene	ND		2.0	2.0	ug/L			03/20/12 00:12	1
Methyl tert-butyl ether	ND		1.0	1.0	ug/L			03/20/12 00:12	1
Naphthalene	ND		5.0	5.0	ug/L			03/20/12 00:12	1
o-Xylene	ND		1.0	1.0	ug/L			03/20/12 00:12	1

TestAmerica Westfield 3/21/2012

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TestAmerica Job ID: 360-39434-1

Client: Olin Corporation Project/Site: Olin Chemical

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: MB 360-88571/6

Matrix: Water

Analyte

Toluene

Analysis Batch: 88571

C5-C8 Aliphatics (unadjusted)

C9-C12 Aliphatics (unadjusted)

C5-C8 Aliphatics (adjusted)

C9-C12 Aliphatics (adjusted)

C9-C10 Aromatics

Total VPH

Client Sample ID: Method Blank Prep Type: Total/NA

03/20/12 00:12

03/20/12 00:12

MB MB Prepared Result Qualifier RL **RL** Unit D Analyzed Dil Fac 03/20/12 00:12 ND 1.0 1.0 ug/L ND 50 50 ug/L 03/20/12 00:12 ND 50 50 ug/L 03/20/12 00:12 ND 50 ug/L 03/20/12 00:12 ND 50 ug/L 03/20/12 00:12 50

> 50 ug/L

> 50 ug/L

MB MB

ND

ND

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,5-Dibromotoluene (fid)	98		70 - 130		03/20/12 00:12	1
2,5-Dibromotoluene (pid)	110		70 - 130		03/20/12 00:12	1

50

50

Lab Sample ID: LCS 360-88571/3

Matrix: Water

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analysis Batch: 88571								
	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Benzene	100	113		ug/L		113	70 - 130	
Ethylbenzene	100	114		ug/L		114	70 - 130	
m-Xylene & p-Xylene	200	194		ug/L		97	70 - 130	
Methyl tert-butyl ether	100	105		ug/L		105	70 - 130	
Naphthalene	100	114		ug/L		114	70 - 130	
o-Xylene	100	109		ug/L		109	70 - 130	
Toluene	100	110		ug/L		110	70 - 130	
C5-C8 Aliphatics (unadjusted)	300	315		ug/L		105	70 - 130	
C9-C12 Aliphatics (unadjusted)	300	266		ug/L		89	70 - 130	
C9-C10 Aromatics	100	101		ug/L		101	70 - 130	
Butylcyclohexane	100	87.5		ug/L		88	70 - 130	
1,2,4-Trimethylbenzene	100	110		ug/L		110	70 - 130	
2-Methylpentane	100	106		ug/L		106	70 - 130	
Pentane	100	108		ug/L		108	70 - 130	
n-Nonane	100	86.2		ug/L		86	30 - 130	
n-Decane	100	87.7		ug/L		88	70 - 130	

100

101

ug/L

LCS LCS

Surrogate	%Recovery Qualifier	Limits
2,5-Dibromotoluene (fid)	100	70 - 130
2.5-Dibromotoluene (pid)	82	70 - 130

Lab Sample ID: LCSD 360-88571/4

Matrix: Water

Isooctane

Analysis Batch: 88571

Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

70 - 130

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	100	110		ug/L		110	70 - 130	3	25
Ethylbenzene	100	112		ug/L		112	70 - 130	2	25
m-Xylene & p-Xylene	200	189		ug/L		94	70 - 130	3	25
Methyl tert-butyl ether	100	104		ug/L		104	70 - 130	1	25
Naphthalene	100	114		ug/L		114	70 - 130	0	25

TestAmerica Job ID: 360-39434-1

Client: Olin Corporation Project/Site: Olin Chemical

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 360-88571/4

Matrix: Water

Analysis Batch: 88571

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
o-Xylene	100	107		ug/L		107	70 - 130	2	25
Toluene	100	108		ug/L		108	70 - 130	3	25
C5-C8 Aliphatics (unadjusted)	300	306		ug/L		102	70 - 130	3	25
C9-C12 Aliphatics (unadjusted)	300	277		ug/L		92	70 - 130	4	25
C9-C10 Aromatics	100	99.0		ug/L		99	70 - 130	2	25
Butylcyclohexane	100	90.2		ug/L		90	70 - 130	3	25
1,2,4-Trimethylbenzene	100	107		ug/L		107	70 - 130	2	25
2-Methylpentane	100	102		ug/L		102	70 - 130	3	25
Pentane	100	104		ug/L		104	70 - 130	4	25
n-Nonane	100	88.8		ug/L		89	30 - 130	3	25
n-Decane	100	94.4		ug/L		94	70 - 130	7	25
Isooctane	100	97.9		ug/L		98	70 - 130	3	25

LCSD LCSD Surrogate %Recovery Qualifier 2,5-Dibromotoluene (fid) 101 70 - 130 2,5-Dibromotoluene (pid) 70 - 130 83

Lab Sample ID: 360-39434-1 MS

Matrix: Water

Analysis Batch: 88571

Client Sample ID: OC-GW 16R

Prep Type: Total/NA

Analysis Batch: 88571	Commis	Camania	Cmiles	ме	ме				0/ Doc
	•	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Benzene	ND		400	459		ug/L		115	70 - 130
Ethylbenzene	ND		400	467		ug/L		117	70 - 130
m-Xylene & p-Xylene	ND		800	769		ug/L		96	70 - 130
Methyl tert-butyl ether	ND		400	411		ug/L		103	70 - 130
Naphthalene	ND		400	447		ug/L		112	70 - 130
o-Xylene	8.4		400	444		ug/L		109	70 - 130
Toluene	ND		400	443		ug/L		111	70 _ 130
C5-C8 Aliphatics (unadjusted)	1500		1200	2920		ug/L		118	70 - 130
C9-C12 Aliphatics (unadjusted)	ND		1200	1220		ug/L		102	70 - 130
C9-C10 Aromatics	ND		400	462		ug/L		115	70 _ 130
Butylcyclohexane	ND		400	393		ug/L		98	70 - 130
1,2,4-Trimethylbenzene	ND		400	443		ug/L		111	70 _ 130
2-Methylpentane	ND		400	424		ug/L		106	70 _ 130
Pentane	ND		400	432		ug/L		108	70 _ 130
n-Nonane	ND		400	392		ug/L		98	30 - 130
n-Decane	ND		400	408		ug/L		102	70 - 130
Isooctane	ND		400	416		ug/L		104	70 - 130

	MS	MS	
Surrogate	%Recovery	Qualifier	Limits
2,5-Dibromotoluene (fid)	99		70 - 130
2,5-Dibromotoluene (pid)	82		70 - 130

Client: Olin Corporation Project/Site: Olin Chemical TestAmerica Job ID: 360-39434-1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 360-39434-1 MSD Client Sample ID: OC-GW 16R **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88571

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	ND		400	452		ug/L		113	70 - 130	1	50
Ethylbenzene	ND		400	452		ug/L		113	70 - 130	3	50
m-Xylene & p-Xylene	ND		800	765		ug/L		96	70 - 130	1	50
Methyl tert-butyl ether	ND		400	400		ug/L		100	70 - 130	3	50
Naphthalene	ND		400	447		ug/L		112	70 - 130	0	50
o-Xylene	8.4		400	439		ug/L		108	70 - 130	1	50
Toluene	ND		400	438		ug/L		110	70 - 130	1	50
C5-C8 Aliphatics (unadjusted)	1500		1200	2990		ug/L		125	70 - 130	3	50
C9-C12 Aliphatics (unadjusted)	ND		1200	1230		ug/L		103	70 - 130	1	50
C9-C10 Aromatics	ND		400	451		ug/L		113	70 - 130	2	50
Butylcyclohexane	ND		400	395		ug/L		99	70 - 130	0	50
1,2,4-Trimethylbenzene	ND		400	438		ug/L		110	70 - 130	1	50
2-Methylpentane	ND		400	432		ug/L		108	70 - 130	2	50
Pentane	ND		400	440		ug/L		110	70 - 130	2	50
n-Nonane	ND		400	396		ug/L		99	30 - 130	1	50
n-Decane	ND		400	413		ug/L		103	70 - 130	1	50
Isooctane	ND		400	422		ug/L		105	70 - 130	1	50

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
2,5-Dibromotoluene (fid)	99		70 - 130
2,5-Dibromotoluene (pid)	79		70 - 130

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 360-88389/2 Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88389

мв мв Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Aluminum ND 100 13 ug/L 03/13/12 15:31 Iron ND 100 21 ug/L 03/13/12 15:31 Chromium ND 5.0 03/13/12 15:31 0.66 ug/L

Lab Sample ID: LCS 360-88389/1 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88389

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Aluminum	 5000	5070		ug/L		101	80 - 120	
Iron	5000	5040		ug/L		101	80 - 120	
Chromium	1000	989		ua/L		99	80 - 120	

Lab Sample ID: LCSD 360-88389/10 Client Sample ID: Lab Control Sample Dup **Matrix: Water**

Analysis Batch: 88389

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Aluminum	 5000	5120		ug/L		102	80 - 120	1	20
Iron	5000	5100		ug/L		102	80 - 120	1	20

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Prep Type: Total/NA

Client: Olin Corporation Project/Site: Olin Chemical TestAmerica Job ID: 360-39434-1

Client Sample ID: OC-GW 16R

Prep Type: Dissolved

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCSD 360-88389/10	Client Sample ID: Lab Control Sample Dup
Matrix: Water	Prep Type: Total/NA
Analysis Ratch: 88389	

Spike LCSD LCSD %Rec. RPD Analyte Added Result Qualifier Unit D %Rec Limits RPD Limit Chromium 1000 998 100 80 - 120 ug/L

Lab Sample ID: 360-39434-1 MS

Matrix: Water

Analysis Batch: 88389

•	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Aluminum	ND		5000	5430		ug/L		109	75 - 125
Iron	1900		5000	7190		ug/L		106	75 - 125
Chromium	ND		1000	1040		ug/L		104	75 - 125

Lab Sample ID: 360-39434-1 DU Client Sample ID: OC-GW 16R **Matrix: Water Prep Type: Dissolved**

Analysis Batch: 88389

	Sample	Sample	DU	DU				RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D	RPD	Limit
Aluminum	ND		ND		ug/L		NC NC	20
Iron	1900		1910		ug/L		0.4	20
Chromium	ND		ND		ug/L		NC	20

Method: 300.0 - Chloride & Sulfate

Lab Sample ID: MB 360-88534/5 Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88534

	MB	MB								
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	ND		2.0	2.0	mg/L			03/15/12 22:48	1	
Chloride	ND		1.0	1.0	mg/L			03/15/12 22:48	1	

Lab Sample ID: LCS 360-88534/6 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88534

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Sulfate	 80.0	83.3		mg/L		104	85 - 115	
Chloride	40.0	41.3		mg/L		103	85 - 115	

Lab Sample ID: MB 360-88537/3 Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88537

	MB	MB							
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			03/16/12 16:41	1
Chloride	ND		1.0	1.0	mg/L			03/16/12 16:41	1

TestAmerica Westfield 3/21/2012

TestAmerica Job ID: 360-39434-1

Prep Type: Total/NA

Prep Batch: 88493

Client: Olin Corporation

Project/Site: Olin Chemical

Method: 300.0 - Chloride & Sulfate (Continued)

Lab Sample ID: LCS 360-88537/4 **Matrix: Water**

Analysis Batch: 88537

Client Sample ID: Lab Control Sample Prep Type: Total/NA

Spike LCS LCS %Rec. Limits babbA Result Qualifier Unit %Rec Analyte D 80.0 Sulfate 82.5 mg/L 103 85 - 115 Chloride 40.0 40.8 mg/L 102 85 - 115

Method: L107-06-1B - Nitrogen Ammonia

Lab Sample ID: MB 360-88493/1-A Client Sample ID: Method Blank

Matrix: Water

Analysis Batch: 88618

MB MB Analyte Result Qualifier RL RL Unit Prepared Analyzed Dil Fac 0.10 03/16/12 10:29 03/20/12 15:47 Ammonia ND 0.10 mg/L

Lab Sample ID: LCS 360-88493/2-A Client Sample ID: Lab Control Sample Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88618

Prep Batch: 88493 Spike LCS LCS %Rec. babbA Result Qualifier Unit D %Rec

Limits Analyte Ammonia 10.0 8.99 mg/L 90 90 - 110

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 360-88521/3 Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88521

MB MB Result Qualifier RL **RL** Unit Prepared Analyzed Dil Fac Specific Conductance ND 1.0 03/16/12 14:24 umhos/cm

Lab Sample ID: LCS 360-88521/1 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88521

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit %Rec Limits Specific Conductance 1410 1400 umhos/cm 99 85 - 115

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 360-88258/1 Client Sample ID: Lab Control Sample **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88258

Spike LCS LCS %Rec. Added Result Qualifier Unit D Limits Analyte %Rec

SU рН 6.00 90 - 110 5.950 99

DILUTION LOGS

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TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 3/15/17

Analytic									Serial Dilution			·	
Analyst Initials	Date	Method	LIMs Sample ID	Rpťd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
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TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 3/16/12

										Serial I	Dilution		
Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
MIR	3/16/12		39529F16	10 y		mV	10	カレ					M
an in the second			3943482	20 x	500	ML	10	ML					
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Analytical Dilution Preparation Log

Date:

03-12-12

									Serial	Dilution		
Analyst Initials	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2		Final Volume 2	Units	Comments
TOH	8260	39473 _1	5× _{50×}	10	mL	56	mL	5	mL	50	ml	
		39434 - 1	201	2.5								
		39412-2	101	10								
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3/21/2012

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TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 31412

		reparation Log				<u>,</u>			Serial Dilution				
Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
ι Yo	3/14/12	3270 LL	39434-1	IOX	100	uL	1000	ul				8	*
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3/21/2012

Date:

3-20-12 **Analytical Dilution Preparation Log** Serial Dilution Analyst Sample Final Sample Final LIMs Sample ID Rpt'd Dil. Initials Aliquot 2 Units Volume 2 Units Method Aliquot 1 Units Volume 1 Units Comments Rul 3-20-12 39434 CZA 20 X 10 NH3 500 mL ML 20x C3A 39540CLA 10x mL (0 mL CZX lox mL C3A 10% me-500 CYA 10x uh 3 20 12

entries completed by day [new page each day]

TestAmerica Westfield

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 3-19-12

alytical Dilution Freparation Log		Serial Dilution											
nalyst			LUM Commis ID	Rpt'd Dil.	Sample	Units	Final Volume 1	Units	Sample Aliquot 2	Units	Final Volume 2	Units	Comments
itials	Date	Method	LIMs Sample ID	W X	Aliquot 1	mL	50	mL					FOam
mr	3-14-12	MAUPH	39434-11			 / / 	 	1					Foam
	· ver		394627-1	101	5	 	-	 					odor
			-12	25%	2								150 m
			-03	WX_	5			 					
			-04	25x	12								odor
			-D5	WX	5								FOGM
<u>.</u>	 		D6	WX	5								Foam
				WX	15								Foom
		<u> </u>	D7_			++-	++-	++-	1				Foam
			D8	LOX_	5	-	++-						FOGM
			D9	10x	5	++-	++-	++-	SAN SENSE				Foam
			DII	101	5	 -	 						oder
1			Dia	WX	5								
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CMR 3-20-12

TestAmerica Job ID: 360-39434-1

Client: Olin Corporation Project/Site: Olin Chemical

Lab Sample ID: 360-39434-1

Lab Sample ID: 360-39434-2

Lab Sample ID: 360-39434-3

Lab Sample ID: 360-39434-4

TH

03/12/12 13:53

Matrix: Water

Client Sample ID: OC-GW 16R Date Collected: 03/07/12 08:10

Date Received: 03/07/12 17:10

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		20	88289	03/12/12 13:32	TH	TAL WFD
Total/NA	Prep	3510C			88223	03/08/12 15:24	TLV	TAL WFD
Total/NA	Analysis	8270D		1	88264	03/09/12 15:22	JLG	TAL WFD
Total/NA	Prep	3510C	DL		88223	03/08/12 15:24	TLV	TAL WFD
Total/NA	Analysis	8270D	DL	20	88375	03/14/12 16:47	JLG	TAL WFD
Total/NA	Analysis	MAVPH		4	88571	03/20/12 01:18	CMR	TAL WFD
Dissolved	Analysis	6010C		1	88389	03/13/12 15:34	TJS	TAL WFD
Total/NA	Analysis	SM 4500 H+ B		1	88258	03/09/12 09:29	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88493	03/16/12 10:29	AMS	TAL WFD
Total/NA	Analysis	L107-06-1B		1	88618	03/20/12 15:54	RWE	TAL WFD

Client Sample ID: OC-GW 79S

Date Collected: 03/07/12 10:00

Date Received: 03/07/12 17:10

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C			88389	03/13/12 15:47	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:29	GRB	TAL WFD
Total/NA	Analysis	300.0		10	88534	03/16/12 03:05	AMS	TAL WFD
Total/NA	Analysis	300.0		20	88537	03/16/12 22:40	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88493	03/16/12 10:29	AMS	TAL WFD
Total/NA	Analysis	L107-06-1B		20	88618	03/20/12 16:35	RWE	TAL WFD

Client Sample ID: OC-PZ 16RR

Date Collected: 03/07/12 10:20

Date Received: 03/07/12 17:10

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C			88389	03/13/12 15:50	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:30	GRB	TAL WFD
Total/NA	Analysis	300.0		10	88534	03/16/12 03:36	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88493	03/16/12 10:29	AMS	TAL WFD
Total/NA	Analysis	L107-06-1B		20	88618	03/20/12 16:36	RWE	TAL WFD

Client Sample ID: OC-Trip Blank

Analysis

8260C

Date Collected: 03/07/12 08:10

Date Received: 03/	07/12 17:1	0						
Г								
	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab

88289

Laboratory References:

Total/NA

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

TestAmerica Westfield 3/21/2012

TAL WFD

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Matrix: Water

Matrix: Water

Matrix: Water

Certification Summary

Client: Olin Corporation Project/Site: Olin Chemical TestAmerica Job ID: 360-39434-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Westfield	Connecticut	State Program	1	PH-0494
TestAmerica Westfield	Maine	State Program	1	MA00014
TestAmerica Westfield	Massachusetts	State Program	1	M-MA014
TestAmerica Westfield	New Hampshire	NELAC	1	2539
TestAmerica Westfield	New York	NELAC	2	10843
TestAmerica Westfield	Rhode Island	State Program	1	LAO00057
TestAmerica Westfield	Vermont	State Program	1	VT-10843

Accreditation may not be offered or required for all methods and analytes reported in this package . Please contact your project manager for the laboratory's current list of certified methods and analytes.

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		Primary A	ccreditation
Method Name	Description	New Hampshire (NELAC)	Mass
180.1	Turbidity, Nephelometric	P	Р
245.1	Mercury (CVAA)	NP/P	NP
300	Anions, Ion Chromatography	NP/P	NP/P
410.4	COD	NP	NP
524.2	Volatile Org Comp (GC/MS)(list upon request)	Р	Р
524.2	Trihalomethane compounds	Р	Р
608	Organochlorine Pest/PCBs (list upon request)	NP	NP
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP	NP
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW	
1103.1	E.coli		ambient/source
3546	Microwave Extraction	SW	
5035	Closed System Purge and Trap	SW	
6020	Metals (ICP/MS) (list upon request)	NP	
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P
200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	NP/P
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P	
3010A	Preparation, Total Metals	NP/P	
3020A	Preparation, Total Metals	NP/P	
3050B	Preparation, Metals	SW	
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP	
5030B	Purge and Trap	NP	
6010C	Metals (ICP)(list upon request)	NP/SW NP/SW	
7196A	Chromium, Hexavalent	NP/SW NP	
7470A	Mercury (CVAA)		
7471A	Mercury (CVAA)	SW NP/SW	
8081B 8082A	Organochlorine Pesticides (GC)(list upon request)	NP/SW NP/SW	
8260C	PCBs by Gas Chromatography(list upon request)	NP/SW	
8270D	Volatile Org Comp. (GC/MS)(list upon request) Semivolatile Comp.(GC/MS)(list upon request)	NP/SW	
9012A	Cyanide, Total and/or Amenable	NP/SW	
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP	
9045C	pH	SW	
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)	NP/SW	
Enterolert	Enterococcus	17011	ambient/source
L107041C	Nitrogen, Nitrate	NP	4
L107-06-1B	Nitrogen Ammonia	NP	NP
L204001A CN	Cyanide, Total	P	NP/P
L210-001A	Phenolics, Total Recoverable	NP	NP
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)	NP/SW	
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)	NP/SW	
SM 2320B	Alkalinity	NP/P	NP/P
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P
SM 2540D	Solids, Total Suspended (TSS)	NP	NP
SM 3500 CR D	Chromium, Hexavalent	NP	
SM 4500 CI F	Chlorine, Residual		NP
SM 4500 H+ B	pH	NP/P	NP/P
SM 4500 NO2 B	Nitrogen, Nitrite	NP	Р
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP
SM 4500 P E	Phosphorus, Total	NP	NP
SM 4500 S2 D	Sulfide, Total	NP	
SM 5210B	BOD, 5-Day	NP	NP
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP
SM 9215E	Heterotrophic Plate Count (SimPlate)		Р
SM 9222D	Coliforms, Fecal (Membrane Filter)		NP
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P
SM 9223	Coliforms, Total, and E.Coli (Colliert-F/A) Coliforms, Total, and E.Coli (Enumeration)		P

Not all organic compounds are accreditied under YNI For methods with multiple compounds all compounds may not meet TNI criteria, a listing should be obtained from the laboratory The lab carries additional accreditations with several states. This is the laboratories typical listing but is subject to change based on the laboratories current certification standing.

Login Sample Receipt Checklist

Client: Olin Corporation Job Number: 360-39434-1

Login Number: 39434 List Source: TestAmerica Westfield

List Number: 1

Creator: Ard, Vanessa L

Creator. Ard, variessa L		
Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	False	Received Trip Blank(s) not listed on COC.
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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TestAmerica Westfield Westfield Executive Park 53 Southampton Road

Chain of Custody Record

TestAmerica

Westfield, MA 01085 Phone (413) 572-4000 Fax (413) 572-3707			O1	iaiii C	<i>,</i> , ,	/u3	tou	יעי		,,,	u									THE LEADER IN ENV	PRONMENTAL TESTING
	Sampler: BRIAN (Croho	2 d		on, B	ecky	C					С	amier '	Trackir	ng No	(s):			3	OC No: 60-10702.2	
Client Contact: Mr. Brian Guichard	Phone:			E-Ma beck		son@)testar	meric	ainc.	com		1								age: lage 2 of 2	
Company: Olin Corporation					Ĺ						sis R	eau	este	ed					1	ob #:	
Address:	Due Date Requeste	ed:										Ť						100	1	reservation Code	
51 Eames street City: Wilington	TAT Requested (da	ays):					الوط		.		1	T W	K1 150						E	3 - NaOH 3 - Zn Acetate	M - Hexane N - None O - AsNaO2
State, Zip: MA, 01887							F. Ukee			۱ ۱ ده			SH C					FE	٤) - Nitric Acid - NaHSO4 - MeOH	P - Na2O4S Q - Na2SO3 R - Na2S2SO3
Phone:	P0#: REW!0013				ြ				PH				<u>س</u>						P	5 - Amchlor 1 - Ascorbic Acld	S - H2SO4 T - TSP Dodecahydrate
Email: beguichard@olin.com	WO#:				le (Yes or No	es or No) - Ammonia	lck Lis			Imp		837						Brs	J	- Di Water	U - Acetone V - MCAA W - ph 4-5
Project Name: Olin Chemical Superfund Site	Project #: 36001816				ple (Ye				±	.		wcb						container	L		Z - other (specify)
Site;	SSOW#;	,			Sam	MSD (Y) Š	_28D	ွ	Gower								্	L	diet.	
		Sample	Sample Type (C=comp,	Matrix (www.ater, Sexolic, Orwastololi,	Field Filtered	Perform MS/M	6010B - (MOI	2510B, 300.0_28D	0054 m5	2160	MAVPH	270 05						Total Number			
Sample Identification	Sample Date	Time	G=grab) B			<u>ة ا≾</u> XIs	D B	N N	a	Α	A		×330.55	988 0		791923	80 453	Ţ	7	Special Ins	structions/Note:
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FILE COPY

<u>TestAmerica</u>

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Westfield Westfield Executive Park 53 Southampton Road Westfield, MA 01085 CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY:

Tel: (413)572-4000

TestAmerica Job ID: 360-39540-1

Client Project/Site: Olin Chemical Groundwater

For:

Olin Corporation PO BOX 248 Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Jupth Clus

Authorized for release by: 3/22/2012 9:16:08 AM

Joe Chimi

Report Production Representative joe.chimi@testamericainc.com

Designee for

Becky Mason

Project Manager II

becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Job ID: 360-39540-1

Laboratory: TestAmerica Westfield

Narrative

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

Receipt

The samples were received on 03/13/2012; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.2°C.

Metals

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No analytical or quality issues were noted.

General Chemistry

No analytical or quality issues were noted.

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	MassDEP Analytical Protocol Certification Form							
Laboi	ratory Nam	e: TestAmeri	ca Westfield	Project #:	360-395	40-1		
Proje	ect Location	: Olin Quarterl	y Groundwater	RTN:				
This form provides certifications for the following data set: list Laboratory Sample ID Number(s):								
360-39540-(1-4)								
Matric	ces: X	Groundwater/Surfa	ace Water L	Soil/Sediment	Drinking Water Air	U Other:		
	CAM Protocols (check all that apply below):							
8260	voc _	7470/7471 Hg	Mass DEP VPH	_	7196 Hex Cr	Mass DEP APH		
CAM		CAM III B	CAM IV A L	☐ CAM V B ☐	CAM VI B	CAM IX A		
	SVOC	7010 Metals	Mass DEP EPH	8151 Herbicides	8330 Explosives	TO-15 VOC		
CAM	пь 🗀	CAM III C	CAM IV B	CAM V C 9014 Total	CAM VIII A	CAM IX B		
6010	Metals	6020 Metals	8082 PCB	Cyanide/PAC	6860 Perchlorate			
CAM	III A 💢	CAM III D	CAM V A	CAM VI A	CAM VIII B			
	Affirmativ	e Responses to Qu	estions A throug	h F are required for '	'Presumptive Certainty" s	tatus		
	Were all s	amples received in a	condition consiste	ent with those describe	ed on the Chain-of-Custody,			
Α	properly p	eserved (including te			d prepared/analyzed within			
	method ho					X Yes No		
В	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?							
С		•	•	ll response actions speance standard non-cor	ecified in the selected CAM nformances?	X Yes No		
D				orting requirements sp s for the Acquisition a	pecified in CAM VII A, and Reporting of Analytical	X Yes No		
			•	method conducted with	<u> </u>	Yes No		
E		` , ` `	•	s) for a list of significan	,			
			<u> </u>	ete analyte list reporte		Yes No		
F	evaluated	in a laboratory narrat	ive (including all "I	No" responses to Que		X Yes L No		
	Respo	nses to Questions	G, H and I below	are required for "Pre	sumptive Certainty" statu	IS		
G	protocol(s)	?	<u> </u>	orting limits specified in		X Yes No1		
				nty" status may not ned IO. 1056 (2)(k) and WCS	cessarily meet the data usak	pility and		
				the CAM protocol(s) a		X Yes No ¹		
H		•	•	•				
1 411	Were results reported for the complete analyte list specified in the selected CAM protocol(s)? Yes X No ¹ All negative responses must be addressed in an attached laboratory narrative.							
	-			•				
obtair	l, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.							
Signa		Story	tolus	Position:	Laboratory	Director		
	d Name:	Steven C	. Hartmann	Date:				
This forn	n has been elec	ronically signed and approved						

Detection Summary

Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

Client Sample ID: OC-GW-78S

TestAmerica Job ID: 360-39540-1

Lab Sample ID: 360-39540-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	5.1		5.0	0.66	ug/L	1		6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	490		20	20	mg/L	10	_	300.0	Total/NA
Chloride	27		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	53		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-17-RR	Lab Sample ID: 360-39540-2

Analyte Chromium	Result 5.1	Qualifier	RL 5.0		Unit ug/L	Dil Fac	D	Method 6010C	Prep Type Dissolved
Analyte		Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Sulfate	460		20	20	mg/L	10	_	300.0	Total/NA
Chloride	22		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	53		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-25 Lab Sample ID: 360-39540-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	3.1	J	5.0	0.66	ug/L	1	_	6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	100		20	20	mg/L	10	_	300.0	Total/NA
Chloride	69		10	10	mg/L	10		300.0	Total/NA
Ammonia	50		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	660		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-18R Lab Sample ID: 360-39540-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	14		5.0	0.66	ug/L	1	_	6010C	Dissolved
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	790		20	20	mg/L	10	_	300.0	Total/NA
Chloride	290		10	10	mg/L	10		300.0	Total/NA
Ammonia	140		2.0	2.0	mg/L	20		L107-06-1B	Total/NA
Specific Conductance	2600		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

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Method Summary

Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL WFD
300.0	Chloride & Sulfate	40CFR136A	TAL WFD
L107-06-1B	Nitrogen Ammonia	LACHAT	TAL WFD
SM 2510B	Conductivity, Specific Conductance	SM	TAL WFD

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

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Sample Summary

Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
360-39540-1	OC-GW-78S	Water	03/12/12 08:45	03/13/12 17:00
360-39540-2	OC-PZ-17-RR	Water	03/12/12 09:05	03/13/12 17:00
360-39540-3	OC-GW-25	Water	03/12/12 11:05	03/13/12 17:00
360-39540-4	OC-PZ-18R	Water	03/12/12 10:20	03/13/12 17:00

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Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

Lab Sample ID: 360-39540-1

TestAmerica Job ID: 360-39540-1

Client Sample ID: OC-GW-78S Lab San

Date Collected: 03/12/12 08:45 Matrix: Water

Date Received: 03/13/12 17:00

Method: 6010C - Metals (ICP) -	Dissolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/14/12 15:36	1
Chromium	5.1		5.0	0.66	ug/L			03/14/12 15:36	1
General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	490		20	20	mg/L			03/16/12 04:13	10
Chloride	27		1.0	1.0	mg/L			03/16/12 03:56	1
Ammonia	53		1.0	1.0	mg/L		03/19/12 11:49	03/20/12 16:40	10
Specific Conductance	1300		1.0	1.0	umhos/cm			03/16/12 14:37	1

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Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Client Sample ID: OC-PZ-17-RR

Lab Sample ID: 360-39540-2

Date Collected: 03/12/12 09:05 Matrix: Water

Date Collected: 03/12/12 09:05 Matrix: Wate Date Received: 03/13/12 17:00

Method: 6010C - Metals (ICP)	- Dissolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/14/12 15:39	1
Chromium	5.1		5.0	0.66	ug/L			03/14/12 15:39	1
- General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	460		20	20	mg/L			03/16/12 04:48	10
Chloride	22		1.0	1.0	mg/L			03/16/12 04:31	1
Ammonia	53		1.0	1.0	mg/L		03/19/12 11:49	03/20/12 16:41	10
Specific Conductance	1300		1.0	1.0	umhos/cm			03/16/12 14:39	1

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Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Lab Sample ID: 360-39540-3

Matrice Matrice

Matrix: Water

Date Collected	: 03/12/12 11:05
Date Received	: 03/13/12 17:00

Client Sample ID: OC-GW-25

Method: 6010C - Metals (ICP)	- Dissolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/14/12 15:42	1
Chromium	3.1	J	5.0	0.66	ug/L			03/14/12 15:42	1
- General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	100		20	20	mg/L			03/16/12 05:22	10
Chloride	69		10	10	mg/L			03/16/12 05:22	10
Ammonia	50		1.0	1.0	mg/L		03/19/12 11:49	03/20/12 16:41	10
Specific Conductance	660		1.0	1.0	umhos/cm			03/16/12 14:45	

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Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Client Sample ID: OC-PZ-18R Lab Sample ID: 360-39540-4

Date Collected: 03/12/12 10:20 Matrix: Water

Date Received: 03/13/12 17:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L		<u> </u>	03/14/12 15:45	1
Chromium	14		5.0	0.66	ug/L			03/14/12 15:45	1
General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	790		20	20	mg/L			03/16/12 23:15	10
Chloride	290		10	10	mg/L			03/16/12 23:15	10
Ammonia	140		2.0	2.0	mg/L		03/19/12 11:49	03/20/12 16:42	20
			1.0					03/16/12 14:48	

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Definitions/Glossary

Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
\(\psi \)	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

TestAmerica Westfield 3/22/2012

QC Association Summary

Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Metals

Analysis Batch: 88431

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-1	OC-GW-78S	Dissolved	Water	6010C	
360-39540-2	OC-PZ-17-RR	Dissolved	Water	6010C	
360-39540-3	OC-GW-25	Dissolved	Water	6010C	
360-39540-4	OC-PZ-18R	Dissolved	Water	6010C	
LCS 360-88431/17	Lab Control Sample	Total/NA	Water	6010C	
LCSD 360-88431/22	Lab Control Sample Dup	Total/NA	Water	6010C	
MB 360-88431/18	Method Blank	Total/NA	Water	6010C	

General Chemistry

Analysis Batch: 88521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-1	OC-GW-78S	Total/NA	Water	SM 2510B	
360-39540-2	OC-PZ-17-RR	Total/NA	Water	SM 2510B	
360-39540-3	OC-GW-25	Total/NA	Water	SM 2510B	
360-39540-3 DU	OC-GW-25	Total/NA	Water	SM 2510B	
360-39540-4	OC-PZ-18R	Total/NA	Water	SM 2510B	
LCS 360-88521/1	Lab Control Sample	Total/NA	Water	SM 2510B	
MB 360-88521/3	Method Blank	Total/NA	Water	SM 2510B	

Prep Batch: 88533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-1	OC-GW-78S	Total/NA	Water	Distill/Ammonia	
360-39540-2	OC-PZ-17-RR	Total/NA	Water	Distill/Ammonia	
360-39540-3	OC-GW-25	Total/NA	Water	Distill/Ammonia	
360-39540-4	OC-PZ-18R	Total/NA	Water	Distill/Ammonia	
LCS 360-88533/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 360-88533/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 88534

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-1	OC-GW-78S	Total/NA	Water	300.0	<u> </u>
360-39540-1	OC-GW-78S	Total/NA	Water	300.0	
360-39540-2	OC-PZ-17-RR	Total/NA	Water	300.0	
360-39540-2	OC-PZ-17-RR	Total/NA	Water	300.0	
360-39540-3	OC-GW-25	Total/NA	Water	300.0	
LCS 360-88534/6	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88534/5	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 88537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-4	OC-PZ-18R	Total/NA	Water	300.0	
LCS 360-88537/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88537/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 88627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-1	OC-GW-78S	Total/NA	Water	L107-06-1B	88533
360-39540-2	OC-PZ-17-RR	Total/NA	Water	L107-06-1B	88533
360-39540-3	OC-GW-25	Total/NA	Water	L107-06-1B	88533
360-39540-4	OC-PZ-18R	Total/NA	Water	L107-06-1B	88533
LCS 360-88533/2-A	Lab Control Sample	Total/NA	Water	L107-06-1B	88533

TestAmerica Westfield 3/22/2012

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QC Association Summary

Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

General Chemistry (Continued)

Analysis Batch: 88627 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 360-88533/1-A	Method Blank	Total/NA	Water	L107-06-1B	88533

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TestAmerica Job ID: 360-39540-1

Client Sample ID: Method Blank

Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 360-88431/18

Matrix: Water

Analysis Batch: 88431

- The state of the	
Pro	ep Type: Total/NA

мв мв Result Qualifier RL MDL Unit D Dil Fac Analyte Prepared Analyzed 13 ug/L 100 Aluminum ND 03/14/12 13:13 ND 5.0 03/14/12 13:13 Chromium 0.66 ug/L

Lab Sample ID: LCS 360-88431/17 Client Sample ID: Lab Control Sample **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88431

		Spike	LCS	LCS				%Rec.	
Anal	yte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Alum	inum	 5000	5060		ug/L		101	80 - 120	
Chro	mium	1000	1000		ug/L		100	80 - 120	

Lab Sample ID: LCSD 360-88431/22 Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88431

		Spike	LCSD	LCSD				%Rec.		RPD
Analyte	,	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Aluminum		5000	5170		ug/L		103	80 - 120	2	20
Chromium		1000	1020		ug/L		102	80 - 120	2	20

Method: 300.0 - Chloride & Sulfate

Lab Sample ID: MB 360-88534/5 Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88534

	IVID	IVID							
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			03/15/12 22:48	1
Chloride	ND		1.0	1.0	mg/L			03/15/12 22:48	1

Client Sample ID: Lab Control Sample Lab Sample ID: LCS 360-88534/6 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88534

-	Spike	LCS	LCS				%Rec.		
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Sulfate	 80.0	83.3		mg/L		104	85 - 115		_
Chloride	40.0	41.3		ma/l		103	85 _ 115		

Lab Sample ID: MB 360-88537/3 Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88537

	MB	MB							
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			03/16/12 16:41	1
Chloride	ND		1.0	1.0	mg/L			03/16/12 16:41	1

Lab Sample ID: LCS 360-88537/4

Matrix: Water

Analysis Batch: 88537

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Sulfate	80.0	82.5		mg/L	_	103	85 - 115	

Prep Type: Total/NA

Client Sample ID: Lab Control Sample

TestAmerica Job ID: 360-39540-1

Prep Batch: 88533

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Type: Total/NA

Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

Method: 300.0 - Chloride & Sulfate (Continued)

Lab Sample ID: LCS 360-88537/4 Client Sample ID: Lab Control Sample **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 88537

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D %Rec Limits Chloride 40.0 102 85 - 115 40.8 mg/L

Method: L107-06-1B - Nitrogen Ammonia

Lab Sample ID: MB 360-88533/1-A Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88627

MB MB

Result Qualifier RL Analyte RL Unit Prepared Analyzed Dil Fac 0.10 03/19/12 11:49 03/20/12 16:11 Ammonia ND 0.10 mg/L

Lab Sample ID: LCS 360-88533/2-A Client Sample ID: Lab Control Sample Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88627

Prep Batch: 88533 Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit D %Rec Limits

Ammonia 10.0 10.4 104 90 - 110 mg/L

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 360-88521/3 Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analysis Batch: 88521

мв мв

Dil Fac Analyte Result Qualifier RL **RL** Unit Prepared Analyzed Specific Conductance ND 1.0 1.0 umhos/cm 03/16/12 14:24

Lab Sample ID: LCS 360-88521/1

Matrix: Water

Analysis Batch: 88521

LCS LCS Spike %Rec. Added Result Qualifier Unit %Rec Limits 1410 umhos/cm 1400 99 85 - 115 Specific Conductance

Lab Sample ID: 360-39540-3 DU Client Sample ID: OC-GW-25

Matrix: Water

Analysis Batch: 88521

Sample Sample DU DU RPD Result Qualifier Analyte Result Qualifier Unit RPD I imit Specific Conductance 660 659 umhos/cm 0.3 20

> TestAmerica Westfield 3/22/2012

TestAmerica Job ID: 360-39540-1

Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

Client Sample ID: OC-GW-78S

Date Collected: 03/12/12 08:45 Date Received: 03/13/12 17:00

Lab Sample ID: 360-39540-1

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C			88431	03/14/12 15:36	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:37	GRB	TAL WFD
Total/NA	Analysis	300.0		1	88534	03/16/12 03:56	AMS	TAL WFD
Total/NA	Analysis	300.0		10	88534	03/16/12 04:13	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88533	03/19/12 11:49	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	88627	03/20/12 16:40	RWE	TAL WFD

Client Sample ID: OC-PZ-17-RR

Date Collected: 03/12/12 09:05

Lab Sample ID: 360-39540-2

Matrix: Water

Date Received: 03/13/12 17:00

Lab TAL WFD TAL WFD

Prepared Batch Batch Dilution Batch Prep Type Type Method Run Factor Number or Analyzed Analyst Dissolved 6010C 88431 03/14/12 15:39 TJS Analysis 1 Total/NA Analysis SM 2510B 88521 03/16/12 14:39 GRB Total/NA 300.0 88534 03/16/12 04:31 AMS TAL WFD Analysis 1 Total/NA Analysis 300.0 10 88534 03/16/12 04:48 AMS TAL WFD Total/NA 88533 03/19/12 11:49 **RWE** TAL WFD Prep Distill/Ammonia L107-06-1B 10 88627 03/20/12 16:41 RWE TAL WFD Total/NA Analysis

Client Sample ID: OC-GW-25

Date Collected: 03/12/12 11:05

Date Received: 03/13/12 17:00

Lab Sample ID: 360-39540-3

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88431	03/14/12 15:42	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:45	GRB	TAL WFD
Total/NA	Analysis	300.0		10	88534	03/16/12 05:22	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88533	03/19/12 11:49	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	88627	03/20/12 16:41	RWE	TAL WFD

Client Sample ID: OC-PZ-18R

Date Collected: 03/12/12 10:20

Date Received: 03/13/12 17:00

Lab Sample ID: 360-39540-4

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C			88431	03/14/12 15:45	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:48	GRB	TAL WFD
Total/NA	Analysis	300.0		10	88537	03/16/12 23:15	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88533	03/19/12 11:49	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		20	88627	03/20/12 16:42	RWE	TAL WFD

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Certification Summary

Client: Olin Corporation

Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Westfield	Connecticut	State Program	1	PH-0494
TestAmerica Westfield	Maine	State Program	1	MA00014
TestAmerica Westfield	Massachusetts	State Program	1	M-MA014
TestAmerica Westfield	New Hampshire	NELAC	1	2539
TestAmerica Westfield	New York	NELAC	2	10843
TestAmerica Westfield	Rhode Island	State Program	1	LAO00057
TestAmerica Westfield	Vermont	State Program	1	VT-10843

Accreditation may not be offered or required for all methods and analytes reported in this package . Please contact your project manager for the laboratory's current list of certified methods and analytes.

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		Primary A	Primary Accreditation			
		New Hampshire				
Method Name	Description	(NELAC)	Mass			
180.1	Turbidity, Nephelometric	P ND/D	P			
245.1	Mercury (CVAA)	NP/P	NP NP/P			
300	Anions, Ion Chromatography	NP/P NP	NP/P NP			
410.4	COD	P	P			
524.2 524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P			
608	Trihalomethane compounds Organochlorine Pest/PCBs (list upon request)	NP	NP			
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP NP			
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP NP	NP			
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW				
1103.1	E.coli		ambient/source			
3546	Microwave Extraction	SW				
5035	Closed System Purge and Trap	SW				
6020	Metals (ICP/MS) (list upon request)	NP				
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP			
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P			
200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	NP/P			
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P				
3010A	Preparation, Total Metals	NP/P				
3020A	Preparation, Total Metals	NP/P				
3050B	Preparation, Metals	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP				
5030B	Purge and Trap	NP				
6010C	Metals (ICP)(list upon request)	NP/SW				
7196A	Chromium, Hexavalent	NP/SW				
7470A	Mercury (CVAA)	NP				
7471A	Mercury (CVAA)	SW				
8081B	Organochlorine Pesticides (GC)(list upon request)	NP/SW				
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW				
8260C	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW				
8270D	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW				
9012A	Cyanide, Total and/or Amenable	NP/SW				
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP				
9045C	pH	SW				
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)	NP/SW				
Enterolert	Enterococcus		ambient/source			
L107041C	Nitrogen, Nitrate	NP				
L107-06-1B	Nitrogen Ammonia	NP	NP			
L204001A CN	Cyanide, Total	P	NP/P			
L210-001A	Phenolics, Total Recoverable	NP	NP			
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)	NP/SW NP/SW				
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)	NP/SVV NP/P	NP/P			
SM 2320B	Alkalinity	NP/P	NP/P			
SM 2340B SM 2510B	Total Hardness (as CaCO3) by calculation Conductivity, Specific Conductance	NP/P	NP/P			
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P			
SM 2540C	Solids, Total Dissolved (TDS) Solids, Total Suspended (TSS)	NP NP	NP NP			
SM 3500 CR D	Chromium, Hexavalent	NP	- "			
SM 4500 CF D	Chlorine, Residual	191	NP			
SM 4500 H+ B	pH	NP/P	NP/P			
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P P			
SM 4500 NO2 B	Phosphorus, Orthophosphate	NP/P	NP			
SM 4500 P E	Phosphorus, Total	NP	NP			
SM 4500 F L	Sulfide, Total	NP	 			
SM 5210B	BOD, 5-Day	NP	NP			
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP			
SM 9215E	Heterotrophic Plate Count (SimPlate)		P			
SM 9222D	Coliforms, Fecal (Membrane Filter)		NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		Р			
SM 9223	Coliforms, Total, and E.Coli (Enumeration)		Р			
	omnounds are accreditied under VNI	•	•			

Not all organic compounds are accreditied under YNI For methods with multiple compounds all compounds may not meet TNI criteria, a listing should be obtained from the laboratory The lab carries additional accreditations with several states. This is the laboratories typical listing but is subject to change based on the laboratories current certification standing.

Login Sample Receipt Checklist

Client: Olin Corporation Job Number: 360-39540-1

Login Number: 39540 List Source: TestAmerica Westfield

List Number: 1 Creator: Ard, Vanessa L

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	False	IDs on containers do not match the COC forr sample 4
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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TestAmerica Westfield

Westfield Executive Park 53 Southampton Road Westfield, MA 01085

Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record



Client Information	Sampler: Brian Guichard	b PM: ason	PM: Ison, Becky C									acking	No(s)	ı:		\prod	COC No:						
Client Contact: James Cashwell	Phone:	E-N	Mali:														İ	Page:					
Company:	, pec						Analysis Re												十	Job #:			
Olin Corporation Address:	Due Date Request		33						alysi	3 1404	-que	3101	Ť	Т			2000/20 (C) (S)	Preservation Codes:					
51 Eames Street City: Willington State, Zip: MA, 01887	TAT Requested (d						ō											A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH	M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO5				
Phone:	PO#: REWI0013	6				804/											G - Amchlor	S - H2SO4 T - TSP Dod					
Email: beguichard@olin.com	WO #;	Sor	or Noj	nonla	_	300.0_28D SO4/CI		ļ								100 M	I - Ice J - DI Water	U - Acetone V - MCAA					
Project Name: Olin Quarterly Groundwater	Project#; 36001816	9) ele	res or	·Ammonla	d Al/C	300.0										ntair	K - EDTA L - EDA	W - ph 4-5 Z - other (sp	ecify)				
Site:	SSOW#:	Sami) ası	1-B	filtere	Cond.,										5	Other:						
		Sample		Matrix (W=water, S=solid, O=waste/oli,	i eld Filte	Pertorm MS/MSD	LACH_107_06_1_B	6010B - Fleld fillered Al/Cr	2510B Spec. (***************************************					Total Number			D. f. a. a. a.	
Sample Identification	Sample Date	Time	G=grab) вт Preservation			A		constitues.	N N	7.613 920 P			000 000	133		920	100000		붉	Special Ins	tructions/	Note:	
GW-78\$	3/12/12	8:45	G	Water	Υ	Ť	х	х	х										3	MCP	and a constitution of the		
PZ-17-RR	3/12/12	9:05	G	Water	Y		Х	х	×							ľ			3	<u> </u>			
GW-25	3/12/12	11:05	G	Water	Υ		Х	х	х										3				
OC-GW-78S	3/12/12	10:20	G	Water	Υ		Х	Х	х									3	3				
																			3				
					_														3				
						_							┪	+					3				
																			3				
					\perp														3				
Possible Hazard Identification Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological									Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Return To Client Disposal By Lab Archive For Months														
										Special Instructions/QC Requirements:													
Empty Kit Relinquished by:	Date:					Time:								Method of Shipment:									
Relinquisted by	Date/Time: Compai						Received						3//3/12						11:50 Campany A. C.				
Relinquished by:	Date/Tiple: //2 //2 Company					- 1	Ĺ,	deceived by:						Date/Time: 3-/3-/2						14co Company			
Relinquished of Lerry 9	Date/Time: 3-42 17/10 Company						Received by: Cooler Temperature(s) °C and Other Re									7	/Ime	<u>3 /</u>	12	a 1700 Company 797			
Custody Seals Intact:										ure(s) '	°C and (Other	Remar	ks:	$\partial_{\epsilon} \bar{\mathcal{O}}$	7	1	<u>i</u>					